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Abbreviations and Acronyms

AFDW ash-free dry weight

Ca calcium cm centimeter(s)

CompQAP Comprehensive Quality Assurance Plan

District South Florida Water Management District

DOP dissolved organic phosphorus DRP dissolved reactive phosphorus

DW dry weight

ENR Everglades Nutrient Removal

IFAS Institute for Food and Agricultural Sciences

g/m3 gram(s) per cubic meter

mg/L milligram(s) per liter

P phosphorus

PSTA periphyton-based stormwater

QC quality control

SAV submerged aquatic vegetation

SRP Scientific Review Panel

TDP total dissolved phosphorus
TIP total inorganic phosphorus
TOP total organic phosphorus

TP total phosphorus

TPP total particulate phosphorus

WAR Water and Air Research

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Acknowledgements

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VI

Executive Summary

Executive Summary

The South Florida Water Management District (District) is conducting research focused on determining the effectiveness and design criteria of potential advanced treatment technologies to support reduction of phosphorus (P) loads in surface waters entering the remaining Everglades. Periphyton-based stormwater treatment areas (PSTAs) are one of the advanced treatment technologies being researched by the District for potential application downstream of the macrophyte-based stormwater treatment areas (STAs).

Twenty-four portable PSTA (Porta-PSTA) mesocosms were operated by the CH2M HILL project team for approximately 18 months as part of the PSTA Research and Demonstration Project sponsored by the District. Routine monitoring of the Porta-PSTAs was completed in early October 2000.

One aspect of the Porta-PSTA research was the documentation of input/output mass balances for water and total phosphorus (TP). Mass balance work under the District contract was solely dependent on calculated inflow and outflow data coupled with analysis of sediment and some of the biological data. With the support provided by the Florida Department of Environmental Protection (FDEP), supplemental final mass balance "destructive" sampling was conducted on 10 of the 24 Porta-PSTA mesocosms on February 13, 14, and 15, 2001, to better characterize the total mass of organic matter, P and calcium present in the mesocosms. For this supplemental analysis study, the following Porta-PSTAs were sampled:

- Peat Treatment PP-3 (Tanks 12, 14, 17)
- Shellrock Treatment PP-4 (Tanks 3, 5, 10)
- Sand Control Treatments PP-7 and PP-17 (acid-washed) (Tanks 19, 20)
- No Substrate Control Treatment PP-18 (Tank 21)
- No Substrate Aquamat Control Treatment PP-19 (Tank 22)

Exhibit ES-1 presents a treatment summary of the total mass of TP, calcium, and ash-free dry weight (AFDW) biomass (organic matter) present for each compartment in each Porta-PSTA at the time of the final mass balance sampling.

AFDW Biomass

Macrophytes were the primary biomass compartment for the peat-soil mesocosms with 614 grams (g) AFDW/ per square meter (m²). Periphyton biomass in the peat treatment was much lower, with an average of 78 grams AFDW/m². The shellrock treatment biomass was fairly evenly distributed between macrophytes and periphyton, with averages of 304 and 215 g AFDW/m², respectively. The sand treatments had a more even distribution of AFDW biomass between the periphyton and macrophyte compartments, with all averages near 200 g AFDW/m². The non-soil control treatments had periphyton biomass (approximately 300 g AFDW/m²) slightly above the shellrock and sand soil treatments. Consumer biomass was negligible compared to plant biomass in all treatments (1.3 g AFDW/m² or less). Total

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EXHIBIT ES-1Summary of Porta-PSTA Final Mass Balance Sampling, February 2001

Treatment Number Substrate	PP-3 Peat	PP-4 Shell	PP-7 Sand	PP-17 Sand	PP-18 None	PP-19 Aquamat
Biomass (g AFDW/m²)						
Periphyton	78	215	249	177	296	309
Macrophytes	614	304	223	183	0	0
Consumers	0.9	0.1	0.3	0.0	1.3	2.0
Total	693	519	472	360	297	311
Total Phosphorus (mg/m²)						
Water	6.1	4.1	4.0	6.9	3.4	3.6
Periphyton	95	391	626	220	184	273
Macrophytes	320	230	195	180	0	0
Consumers	5.3	0.1	2.5	0.0	5.7	9.1
Soil	9,460	270,701	5,625	5,675	0	0
Total	9,886	271,327	6,453	6,082	193	285
Calcium (g/m²)						
Periphyton	15.1	202.9	235.8	116.8	268.5	295.4
Macrophytes	4.8	11.0	1.4	2.2	0	0
Consumers	0.2	0.0	0.1	0.0	0.8	1.0
Soil	8,730	43,663	834	216	0	0
Total	8,750	43,877	1,071	335	269	296

Number of replicates: PP-3 (3), PP-4 (3), PP-7 (1), PP-17 (1), PP-18 (1), PP-19 (1)

ending biomass in all treatments ranged from a low of 297 g AFDW/m² in the non-soil control tank to a high of 693 g AFDW/m² in the peat mesocosms.

Total Phosphorus

The soil compartment had the highest TP content for all media sampled in the Porta-PSTAs. The shellrock treatment had the highest average soil TP (270,701 milligrams [mg] P/m^2), the peat soils averaged 9,886 mg P/m^2 , and the sand treatments had relatively equal soil TP averages (5,625 and 5,675 mg P/m^2). Excluding the soil compartment, periphyton (floating/metaphyton, benthic, and wall mat) had the highest TP content in all treatments (varying from 184 mg P/m^2 to 626 mg P/m^2), with the exception of the peat treatment. Macrophytes were the next dominant TP component (after soil) in the peat treatment, with an average TP of 320 mg P/m^2 . Consumer populations and water in the Porta-PSTA mesocosms have relatively insignificant quantities of TP compared to the soil and plant components.

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Calcium

When present, the soil compartment had the highest calcium (Ca) content for all media sampled in the Porta-PSTAs. The shellrock treatment had the highest average soil calcium content (43,663 g Ca/m²), the peat-soil treatment averaged 8,730 g Ca/m², and the two sand treatments (PP-7 and PP-17) had 834 and 216 g Ca/m², respectively. Excluding the soil compartment, periphyton had the highest calcium content in all treatments. The peat treatment had the lowest periphyton calcium content (15.1 g Ca/m²), while the Aquamat treatment averaged 295 g Ca/m². Consumers (primarily snails) accounted for a relatively insignificant amount of calcium.

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Introduction

Introduction

1.1 Background

The South Florida Water Management District (District) is conducting research focused on determining the effectiveness and design criteria of potential advanced treatment technologies to support reduction of phosphorus (P) loads in surface waters entering the remaining Everglades. Periphyton-based stormwater treatment areas (PSTAs) are one of the advanced treatment technologies being researched by the District for potential application downstream of the macrophyte-based stormwater treatment areas (STAs).

Twenty-four Portable PSTA (Porta-PSTA) mesocosms were operated and studied by the CH2M HILL project team for approximately 18 months as part of the PSTA Research and Demonstration Project sponsored by the District (Contract C-E8624). Monitoring of the Porta-PSTAs began in April 1999 and was completed in early October 2000. These mesocosms are located within the District's Everglades Nutrient Removal (ENR) project area at the South Advanced Technology Research Compound, and represent the smallest scale of PSTA research. For this reason, they are the only PSTA research platform (scale) that reasonably could be completely sampled for a quantitative final assessment of biomass, P, and calcium. Larger mesocosms (PSTA Test Cells) were monitored for approximately 26 months (through March 2001) under the same District contract, and studies of Field-Scale (demonstration) PSTAs are currently under start-up mode.

One aspect of the Porta-PSTA research was the documentation of input/output mass balances for water and total phosphorus (TP). Recommendations from the PSTA Scientific Review Panel (SRP) and other project reviewers during the September 9 and 10, 2000, and the January 13 and 14, 2001, SRP workshops included performance of final mass (destructive) sampling of a subset of the Porta-PSTAs to support the mass balance analyses. Mass balance sampling included organic matter, P, and calcium for all living and non-living components of the mesocosms.

Final mass balance sampling was conducted on 10 representative Porta-PSTA mesocosms on February 13, 14, and 15, 2001. This report documents the results from the Porta-PSTA mass balance study.

1.2 Project Objectives

This study had two primary objectives:

- 1. To quantify the ending mass of TP in the various potential storage media within a subset of the Porta-PSTAs
- 2. To support mass balance assessments previously based solely on input and output information.

Also of interest were the final masses of organic matter (biomass) and calcium (because of its association with P mineral storages) in the PSTA mesocosms.

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Description of the Study Rationale and Site

SECTION 2

Description of the Study Site

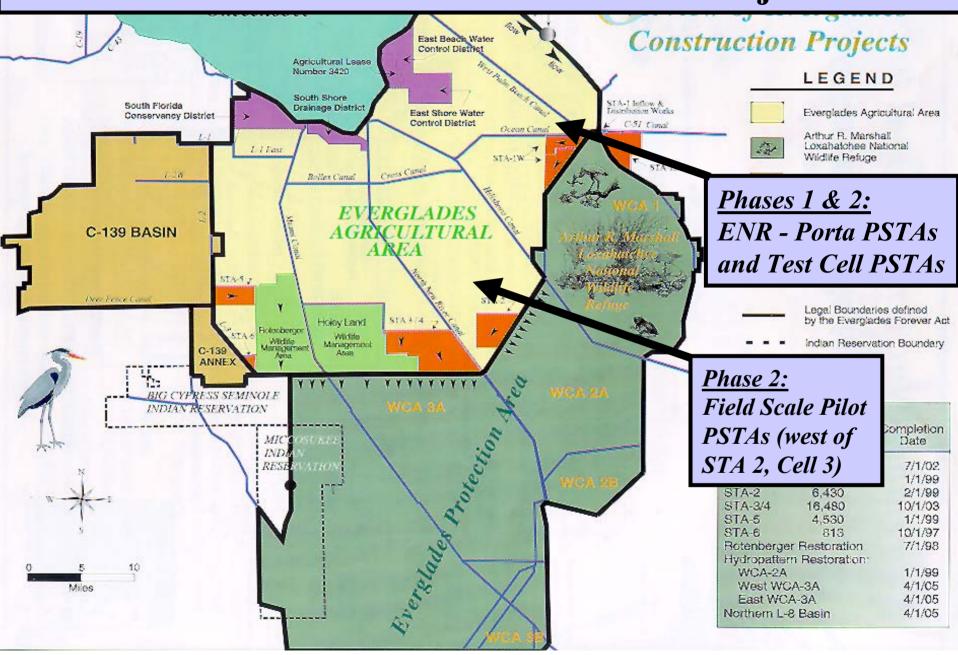
The Porta-PSTA mesocosms are located within the District's ENR project, as shown in Exhibit 2-1. The tanks are 1×6 meters in size (6 m² surface area) and 1 meter deep, and are constructed of fiberglass. For this study, the following 10 Porta-PSTAs were destructively sampled:

- Peat Treatment PP-3 (Tanks 12, 14, 17)
- Shellrock Treatment PP-4 (Tanks 3, 5, 10)
- Sand Control Treatments PP-7 and PP-17 (acid-washed) (Tanks 19, 20)
- No Substrate Control Treatments PP-18 and PP-19 (Tanks 21, 22)

The rationale for this selection was that treatments PP-3, PP-4, and PP-7 had been continuously operated with only a single operational change (water depth lowering) throughout the 18-month study period. These three treatments represent the most likely configuration envisioned for a full-scale PSTA (i.e., sparse macrophytes with periphyton growing on one or more of the following soils: peat, sand, or calcium-rich [limerock or shellrock]). Treatment PP-17 was sampled for comparison to PP-7 and to have a second sand-based tank in the study, and treatments PP-18 and PP-19 were sampled as non-soil controls. Treatments PP-17, PP-18, and PP-19 had only been operated during the Phase 2 period (approximately 6 months), while the other treatments had been operated nearly continuously for the full 18 months.

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PSTA Research & Demonstration Project Sites



Sampling Methods and Analytical Procedures

Sampling Methods and Analytical Procedures

3.1 Field Methods

Sampling methods were based on those specified in the *PSTA Research Plan* (CH2M HILL, April 2001) and further detailed in the *Porta-PSTA Mass Balance* (*Destructive*) Sampling Plan (CH2M HILL, February 2001).

Each of the following compartments in the 10 Porta-PSTAs were sampled as units:

- Floating Periphyton Mat and Metaphyton: All floating periphyton mat and metaphyton were removed from the 10 Porta-PSTAs with an aquarium net and by hand and then homogenized prior to analysis. The total volume of slurry was estimated and then subsampled for TP, total inorganic phosphorus (TIP), calcium (Ca), dry weight (DW), and ash-free dry weight (AFDW) analyses.
- Wall Periphyton: Periphyton was removed from the Porta-PSTA tank walls for estimation of the wet volume. After mixing, the periphyton was subsampled for TP, TIP, Ca, DW, and AFDW analyses. Periphyton wet volume was determined by gravity drainage of excess water and measurement in a volumetric cylinder.
- **Benthic Periphyton:** The benthic periphyton was removed from each of the 10 Porta-PSTAs by hand for estimation of wet volume. After homogenization, the periphyton was subsampled for TP, TIP, Ca, DW, and AFDW analyses.
- End Wall Periphyton Taxonomy: Samples of periphyton from the Porta-PSTA outflow endwalls were removed by scraping a known area of 0.0165 m², the volume estimated and the sample submitted to the laboratory for taxonomic analysis (diatoms only). The purpose of this taxonomic analysis was to provide data for possible correlation to Porta-PSTA outflow TP concentrations.
- Macrophyte Harvesting: All macrophytes (including both submerged aquatic vegetation [SAV] and emergent plants) from the 10 Porta-PSTAs were removed and rinsed before determination of total wet weight. A subsample of this macrophyte biomass was divided into above- and belowground portions, which were then weighed wet to determine a root:shoot ratio. Subsamples from each macrophyte portion from each tank were sumitted for analysis of TP, Ca, DW and AFDW.
- **Grazers (Snails, Fish, etc.):** All grazers observed in each of the 10 Porta-PSTAs were collected as a single sample for analysis from each tank. The consumers were analyzed for TP, Ca, DW, and AFDW.
- **Sediments:** Soils were collected at two depths (0- to 10-centimeter [cm] and 10- to 20-cm increments) using a small shovel and composited from a minimum of 10 locations within each of the 8 soil-based Porta-PSTAs. These composite samples were subsampled for estimates of bulk density, percent solids, TP, TIP, and Ca.

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- Macrophyte Stem Counts: Emergent plant stems were counted and then divided into live and dead subgroups. Stems that were green above the water level were classified as live; stems that were predominantly brown above the water level were classified as dead.
- Horizon Markers: Feldspar horizon markers were originally placed in each of the substrate treatment Porta-PSTAs to quantify soil accumulation rate. Soils were cored at each of the horizon markers, and any soil over the horizon marker was to be measured and collected for analysis. None of the horizon markers in the Porta-PSTAs were evident at the time of final mass balance sampling.

In addition to the media listed above, inflow and outflow water was sampled on February 13, 2001, for all 24 of the Porta-PSTAs. Data from these samples were used to assess the TP in the surface water present in each tank at the time of sampling.

Except for soils and water, each compartment was completely sampled and homogenized, measured (wet weight and/or volume), and subsampled for gravimetric and chemical analyses. Two subsamples were analyzed for each of the three periphyton components (excludes endwall periphyton), for the macrophytes, and for each of the soil compartments. Grazers were entirely consumed in a single sample for analysis. Soil samples were composited from a minimum of 10 locations in each tank, and the composited samples were subsampled for analyses. A summary of the analytical parameters by matrix is provided in Exhibit 3-1.

EXHIBIT 3-1

Analytical Parameters for the Porta-PSTA Final Mass Balance Sampling

	Parameters and Number of Samples								
Media	No. of Cells	TP	TIP	Tax	Са	DW	AFDW	Wet Bulk Density	% Solids
Floating Periphyton/Metaphyton	10	Χ	X		Χ	Χ	Χ		
Consumers (snails, fish, etc.)	10	Χ	Χ		Х	Х	Χ		
Wall Periphyton	10	Χ	Χ		Х	Х	Χ		
Benthic Periphyton	10	X	Χ		Х	Х	Χ		
Endwall Periphyton	10			Χ					
Macrophytes- above Ground	8	Х	Χ		Х	Х	Χ		
Macrophytes- below Ground	8	Х	Χ		Х	Х	Χ		
Sediments (0–10 cm)	8	Х	Χ		Х			Х	X
(10-20 cm)	8	Х	Χ		Х			Х	Χ

3.2 Field and Analytical Team Members

CH2M HILL personnel collected the Porta-PSTA destructive samples in accordance with CH2M HILL's Comprehensive Quality Assurance Plan (CompQAP) No. 910036G. In

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addition, Wetland Solutions, Inc., (WSI) personnel participated in sample collection in accordance with WSI's CompQAP No. (21003). District staff also participated in the efforts.

Analytical work was conducted by the following laboratories:

- University of Florida Institute of Food and Agricultural Sciences (IFAS) (CompQAP No. 910051) (all P analyses)
- PPB Laboratories (CompQAP No. 870017-19) (DW, AFDW, and calcium)
- Law Engineering (CompQAP No. 950024) (bulk densities)
- Water and Air Research (WAR) (CompQAP No. 900211-15) (diatom taxonomic analyses)

A detailed breakdown of parameters by laboratory and analytical methods can be reviewed in the *Porta-PSTA Mass Balance (Destructive) Sampling Plan* (CH2M HILL, February 2001).

3.3 Quality Control

All quality control (QC) protocols outline in the *Porta-PSTA Mass Balance (Destructive) Sampling Plan* (CH2M HILL, February 2001) were followed. These included:

- Field QC samples
- Sample management sample labels, custody, and handling
- Field recordkeeping
- Data management

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Results

Results

Detailed summary tables quantifying the total mass of TP, calcium, and carbon (organic matter) present in each sampled compartment for each of the Porta-PSTA treatments are presented in Appendix A. Field sheets and chain of custody forms are presented in Appendix B. Detailed lab reports from PPB (including Law Engineering results), IFAS, and WAR are provided in Appendices C, D, and E, respectively.

4.1 Water

Exhibit 4-1 summarizes the P water final mass balance results for each of the Porta-PSTA treatments monitored during destructive sampling. Inflow water quality samples were collected from the Porta-PSTA head tank and resulted in an average TP inflow concentration of 0.020 grams per cubic meter (g/m^3) (equivalent to milligrams per liter [mg/L]). Average Porta-PSTA TP outflow concentrations ranged from 0.011 g/m^3 to 0.021 g/m^3 , with Porta-PSTA treatments PP-3 (Peat) and PP-17 (Sand) having the higher TP concentrations. PP-3 also exhibited a higher average total particulate phosphorus (TPP) concentration $(0.013 g/m^3)$ compared to the other treatments sampled $(0.002 \text{ to } 0.007 \text{ g/m}^3)$. Water total mass amounts were estimated based on outflow concentration alone, assuming a relatively well mixed hydraulic condition in the tanks.

4.2 Periphyton

Exhibit 4-2 summarizes the average mass of TP, calcium, and biomass in the periphyton compartment for each Porta-PSTA treatment at the time of sampling.

Exhibit 4-3 illustrates the total mass of periphyton TP and the percentage found in each compartment for each of the treatments. The benthic mat generally had the highest average mass of TP, compared to the floating mat/metaphyton and wall mat. The benthic mat TP ranged from 68.7 mg P/m² in the peat treatment (PP-3) to 558 mg P/m² in the sand treatment (PP-7). The total average periphyton TP varied from 95 mg P/m² in the peat treatment to 626 mg P/m² in the sand treatment. The average periphyton TP in the floating mat/metaphyton and wall mat component did not fluctuate between treatments as much as the benthic mat samples. The floating mat/metaphyton samples varied from 17.5 mg P/m² in the peat treatment to 86.1 mg P/m² in the Aquamat treatment (PP-19). The acid-rinsed sand treatment (PP-17) had the lowest wall mat TP value (2.3 mg P/m²), while the shellrock treatment (PP-4) averaged 35.3 mg P/m².

Exhibit 4-4 illustrates the average calcium content in periphyton samples and the percentage found in each compartment for each of the treatments. The benthic mat generally had the highest average calcium values, compared to the floating mat/metaphyton and wall mat.

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EXHIBIT 4-1Porta-PSTA Water Final Mass Balance Sampling, February 2001

	Treatment No.						
Soil Type Water Depth (m)	PP-3 Peat 0.31	PP-4 Shellrock 0.37	PP-7 Sand 0.37	PP-17 Sand 0.33	PP-18 None 0.31	PP-19 Aquamat 0.33	
Inflow Water (g/m³)							
TP	0.020	0.020	0.020	0.020	0.020	0.020	
TDP	0.009	0.009	0.009	0.009	0.009	0.009	
DRP	0.006	0.006	0.006	0.006	0.006	0.006	
DOP	0.004	0.004	0.004	0.004	0.004	0.004	
TPP	0.010	0.010	0.010	0.010	0.010	0.010	
Outflow Water (g/m³)							
TP	0.021	0.011	0.011	0.021	0.011	0.011	
TDP	0.008	0.007	0.007	0.014	0.009	0.007	
DRP	0.003	0.003	0.001	0.003	0.003	0.001	
DOP	0.005	0.004	0.006	0.011	0.006	0.006	
TPP	0.013	0.004	0.004	0.007	0.002	0.004	
Phosphorus (mg/m²)ª							
TP	6.05	4.10	4.03	6.88	3.44	3.59	
TDP	2.33	2.61	2.56	4.58	2.82	2.29	
DRP	0.95	1.00	0.37	0.98	0.94	0.33	
DOP	1.38	1.62	2.20	3.60	1.88	1.96	
TPP	3.72	1.49	1.46	2.29	0.63	1.31	

Notes:

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^aPhosphorus in water column based on outflow concentration only.

TP = total phosphorus

TDP = total dissolved phosphorus

DRP = dissolved reactive phosphorus

DOP = dissolved organic phosphorus

TPP = total particulate phosphorus

Exhibit 4-2Porta-PSTA Periphyton Final Mass Balance Sampling, February 2001

Treatment No. Soil Type	PP-3 Peat	PP-4 Shellrock	PP-7 Sand	PP-17 Sand	PP-18 None	PP-19 AquaMat
Tank Bottom Area (m ²)	6	6	6	6	6	6
Dry Weight (g/m ²)			<u> </u>			-
Floating Mat/Metaphyton	25.2	158.2	238.8	229.9	386.0	482.5
Benthic Mat	92.4	552.4	1814.3	810.2	622.0	534.6
Wall Mat	17.2	185.4	116.4	3.3	137.4	203.0
Total	134.8	896.0	2169.5	1043.4	1145.5	1220.0
Wet Weight (g/m²)						
Floating Mat/Metaphyton	535	3,121	2,835	3,250	5,443	7,408
Benthic Mat	1,473	6,312	13,155	7,485	10,205	8,997
Wall Mat	190	2,427	1,058	378	2,248	4,083
Total	2,197	11,861	17,048	11,113	17,897	20,488
Ash-Free Dry Weight (g/m²)						
Floating Mat/Metaphyton	13.0	40.0	58.8	54.6	99.4	126.8
Benthic Mat	58.3	121.7	167.5	121.2	160.7	129.4
Wall Mat	6.7	52.9	23.1	1.2	35.6	52.6
Total	78.0	214.7	249.4	177.0	295.7	308.7
Ash Weight (g/m²)						
Floating Mat/Metaphyton	12.2	118.2	180.1	175.3	286.7	355.7
Benthic Mat	34.1	430.6	1645.5	688.4	461.3	383.4
Wall Mat	10.5	132.5	93.2	19.0	101.9	150.4
Total	56.7	681.3	1918.9	882.8	849.8	889.4
Total Phosphorus (mg/m²)						
Floating Mat/Metaphyton	17.5	48.8	53.4	65.0	66.8	86.1
Benthic Mat	68.7	307.4	554.7	152.3	96.0	151.5
Wall Mat	8.8	35.3	18.3	2.3	21.0	35.1
Total	95.0	391.5	626.5	219.6	183.7	272.6
Total Phosphorus (mg/kg)						
Floating Mat/Metaphyton	564	296	225	283	173	178
Benthic Mat	738	558	307	185	284	283
Wall Mat	496	219	157	678	153	173
Average	561	435	289	210	230	223
TIP (mg/m²)						
Floating Mat/Metaphyton	2.71	20.43	7.38	10.38	17.17	31.06
Benthic Mat	11.94	131.45	36.16	32.42	28.55	48.70
Wall Mat	1.27	12.95	2.33	0.22	2.98	8.36
Total	15.92	164.84	45.87	43.01	48.71	88.13
TIP (mg/kg)						
Floating Mat/Metaphyton	78.81	121.45	31.67	45.09	44.51	64.44
Benthic Mat	128.41	238.51	19.82	40.74	45.60	91.13
Wall Mat	80.47	74.40	20.40	84.01	21.66	42.05
Average	94.05	179.85	21.14	41.23	42.52	72.23
Calcium (g/m²)						
Floating Mat/Metaphyton	4.2	40.4	44.7	43.6	89.7	108.3
Benthic Mat	7.3	99.7	167.7	72.5	145.7	136.5
Wall Mat	3.6	62.7	23.3	0.6	33.2	50.6
Total	15.1	202.9	235.8	116.8	268.5	295.4
Calcium (mg/kg)						
Floating Mat/Metaphyton	199818	250882	207921	189564	232154	224525
Benthic Mat	78291	181129	91916	90587	235844	255084
Wall Mat	210292	326136	217385	195045	241271	249609
Total	151798	218420	108669	111911	234435	242109

Note:

Number of replicates: PP-3 (3), PP-4 (3), PP-7 (1), PP-17 (1), PP-18 (1), PP-19 (1)

TIP = total inorganic phosphorus

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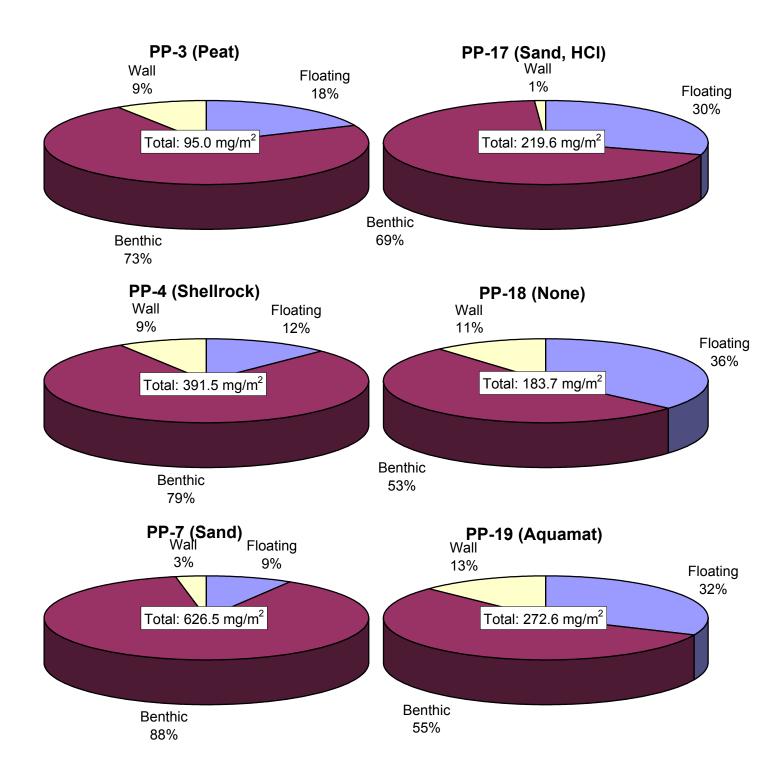


Exhibit 4-3TP Content for each Periphyton Compartment for the Porta-PSTA Treatments

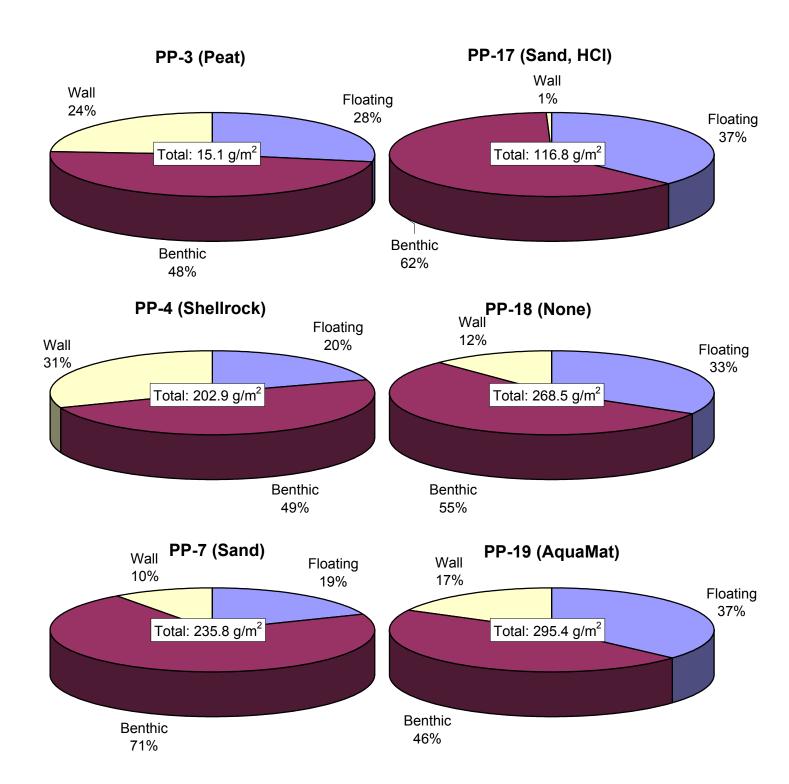


Exhibit 4-4Calcium Content for each Periphyton Compartment for the Porta-PSTA Treatments

The benthic mat calcium varied from 7.3 g Ca/m² in the peat treatment to 168 g Ca/m² in the sand treatment. The Aquamat treatment had the highest estimated total average periphyton calcium content (295 mg Ca/m²), while the peat treatment averaged 15.1 g Ca/m². The Aquamat treatment also displayed the highest average calcium content in its floating mat samples (108 g Ca/m²) compared to the other treatments.

Exhibit 4-5 illustrates the periphyton AFDW biomass and the percentage found in each compartment for each of the treatments. With the exception of the Aquamat treatment, the benthic mat generally had the highest average AFDW biomass, compared to the floating mat/metaphyton and wall mat. The benthic mat AFDW biomass varied from 58.3 g AFDW/m² in the peat treatment to 168 g AFDW/m² in the sand treatment. There was no difference between the average AFDW biomass for the benthic mat (129 g AFDW/m²) and floating mat (129 g AFDW/m²) in the Aquamat treatment. The total periphyton AFDW biomass varied from 78.0 g Ca/m² in the peat treatment to 309 g Ca/m² in the Aquamat treatment. The Aquamat treatment had the highest floating mat/metaphyton AFDW biomass (127 mg AFDW/m²), while the peat treatment averaged 13.0 g AFDW/m². The wall mat samples varied from 1.2 g AFDW/m² in the acid-rinsed sand treatment to 52.9 g AFDW/m² in the shellrock treatment.

4.3 Macrophytes

Exhibit 4-6 summarizes the average mass of TP, calcium, and biomass present in the macrophyte compartment for each Porta-PSTA treatment with macrophytes at the time of sampling.

Exhibit 4-7 illustrates the total mass of macrophyte TP and the percentage found in the aboveground and belowground portions for each of the treatments. There were no significant TP mass differences between the aboveground and belowground portions for each treatment. The peat and shellrock treatments (PP-3 at 320 mg P/m², and PP-4 at 231 mg P/m², respectively) displayed higher total macrophyte TP mass than the sand treatments (PP-7 at 195 mg P/m², and PP-17 at 180 mg P/m²).

Exhibit 4-8 illustrates the average calcium content in macrophyte samples and the percentage found in the aboveground and belowground portions for each of the treatments. The aboveground portion displayed higher calcium values for all treatments except the shellrock treatment, which had higher levels in the belowground portion. The shellrock treatment also exhibited the highest total calcium content for the total macrophyte sample (11 g Ca/m^2) .

Exhibit 4-9 illustrates the macrophyte AFDW biomass and the percentage found in the aboveground and belowground portions of each treatment. The aboveground portion displayed higher average AFDW biomass, compared to the belowground portion for each treatment. The total AFDW biomass (aboveground and belowground) varied from 183 g AFDW/m² in the acid-rinsed sand treatment to 614 g AFDW/m² in the peat treatment.

DFB/16613.DOC 4-6

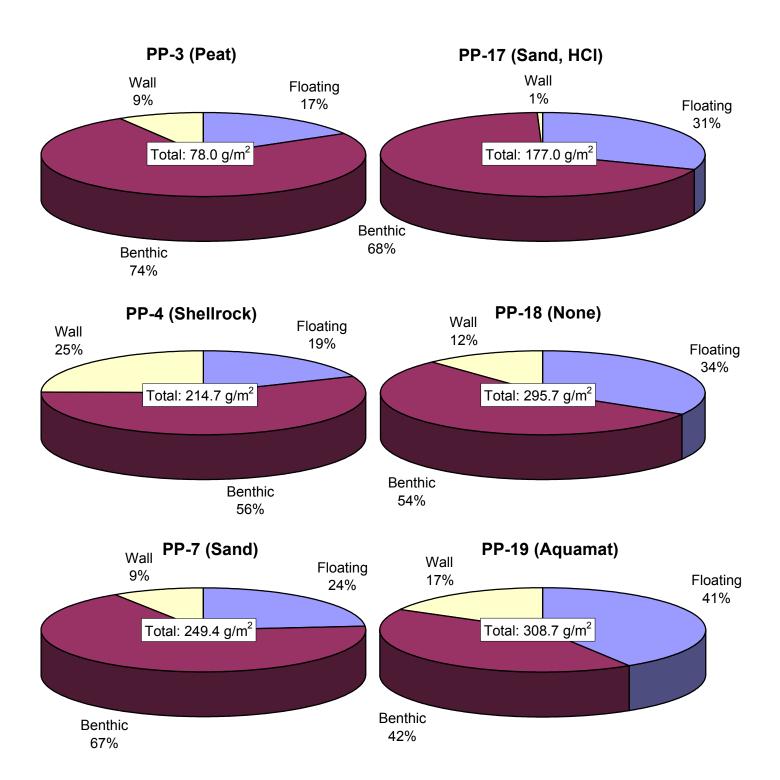


Exhibit 4-5Ash-Free Dry Weight Biomass for each Periphyton Compartment for the Porta-PSTA Treatments

Exhibit 4-6
Porta-PSTA Macrophyte Final Mass Balance Sampling February 2001

Soil Type Peat Total Bottom Area (m²) Shellrock 6 8 9 2 2 2 2 2 8 4 4 9 1 3 1 </th <th>Porta-PSTA Macrophyte Final Mass Bal</th> <th></th> <th></th> <th></th> <th></th>	Porta-PSTA Macrophyte Final Mass Bal					
Tank Bottom Area (m²) 6 6 6 6 Total Phosphorus (mg/m²) Aboveground 178.6 135.2 87.9 88.4 Belowground 141.0 95.3 106.8 91.9 Total 319.7 230.5 194.7 180.3 Total Phosphorus (mg/kg) Aboveground 335.3 558.0 509.6 586.5 Belowground 876.0 976.9 1,333.6 1,277.5 Average 605.7 767.4 921.6 932.0 Wet Weight (g/m²) Aboveground 1,365.2 737.0 663.7 476.8 Total 4,691.0 2,317.2 1,493.3 1,103.3 Dry Weight (g/m²) Aboveground 526.1 277.4 173.1 153.1 Belowground 161.9 103.6 79.8 71.8 Total 688.0 381.0 252.9 224.9 Ash-Free Dry Weight (g/m²) 470.6 240.8 152.6 123.9	Treatment No.	PP-3	PP-4	PP-7	PP-17	
Total Phosphorus (mg/m²) Aboveground 178.6 135.2 87.9 88.4 Belowground 141.0 95.3 106.8 91.9 Total 319.7 230.5 194.7 180.3 Total Phosphorus (mg/kg) 335.3 558.0 509.6 586.5 Belowground 876.0 976.9 1,333.6 1,277.5 Average 605.7 767.4 921.6 932.0 Wet Weight (g/m²) Aboveground 1,365.2 737.0 663.7 476.8 Total 4,691.0 2,317.2 1,493.3 1,103.3 Dry Weight (g/m²) Aboveground 161.9 103.6 79.8 71.8 Total 688.0 381.0 252.9 224.9 Ash-Free Dry Weight (g/m²) Aboveground 470.6 240.8 152.6 123.9 Belowground 143.6 63.6 70.0 59.2 Total 614.3 304.4 222.7 183.1 Ash-Weight (g/m²)	_					
Aboveground 178.6 135.2 87.9 88.4 Belowground 141.0 95.3 106.8 91.9 Total 319.7 230.5 194.7 180.3 Total Phosphorus (mg/kg) Aboveground 876.0 976.9 1,333.6 1,277.5 Average 605.7 767.4 921.6 932.0 Wet Weight (g/m²) Aboveground 3,315.6 1,582.0 829.6 626.6 Belowground 1,365.2 737.0 663.7 476.8 Total 4,691.0 2,317.2 1,493.3 1,103.3 Dry Weight (g/m²) Aboveground 526.1 277.4 173.1 153.1 Belowground 161.9 103.6 79.8 71.8 Total 688.0 381.0 252.9 224.9 Ash-Free Dry Weight (g/m²) Aboveground 470.6 240.8 152.6 123.9 Belowground 143.6 63.6 70.0 59.2 Total 614.3 304.4 222.7 183.1 Ash-Weight (g/m²) Aboveground 55.4 36.6 20.4 29.2 Belowground 18.3 40.0 9.8 12.6 Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 18.3 40.0 9.8 12.6 Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 5.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) Live 158 89 Chead Stem Counts (#/m²) Live 158 89 Live Dead 364 119	Tank Bottom Area (m²)	6	6	6	6	
Belowground 141.0 95.3 106.8 91.9 Total Phosphorus (mg/kg) 319.7 230.5 194.7 180.3 Total Phosphorus (mg/kg) Aboveground 335.3 558.0 509.6 586.5 Belowground 876.0 976.9 1,333.6 1,277.5 Average 605.7 767.4 921.6 932.0 Wet Weight (g/m²) Aboveground 1,365.2 737.0 663.7 476.8 Total 4,691.0 2,317.2 1,493.3 1,103.3 Dry Weight (g/m²) Aboveground 161.9 103.6 79.8 71.8 Aboveground 161.9 103.6 79.8 71.8 <th< td=""><td>Total Phosphorus (mg/m²)</td><td></td><td></td><td></td><td></td></th<>	Total Phosphorus (mg/m²)					
Total Phosphorus (mg/kg) Aboveground 876.0 976.9 1,333.6 1,277.5 Average 605.7 767.4 921.6 932.0 Wet Weight (g/m²) Aboveground 3,315.6 1,582.0 829.6 626.6 Belowground 1,365.2 737.0 663.7 476.8 Total 4,691.0 2,317.2 1,493.3 1,103.3 Dry Weight (g/m²) Aboveground 526.1 277.4 173.1 153.1 Belowground 161.9 103.6 79.8 71.8 Total 688.0 381.0 252.9 224.9 Ash-Free Dry Weight (g/m²) Aboveground 470.6 240.8 152.6 123.9 Belowground 143.6 63.6 70.0 59.2 Total 614.3 304.4 222.7 183.1 Ash-Weight (g/m²) Aboveground 55.4 36.6 20.4 29.2 Belowground 18.3 40.0 9.8 12.6 Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 3.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) Live 158 89 Dead 364 119	Aboveground	178.6	135.2	87.9	88.4	
Total Phosphorus (mg/kg) Aboveground 335.3 558.0 509.6 586.5 Belowground 876.0 976.9 1,333.6 1,277.5 Average 605.7 767.4 921.6 932.0 Wet Weight (g/m²) 3,315.6 1,582.0 829.6 626.6 Belowground 1,365.2 737.0 663.7 476.8 Total 4,691.0 2,317.2 1,493.3 1,103.3 Dry Weight (g/m²) Aboveground 526.1 277.4 173.1 153.1 Belowground 161.9 103.6 79.8 71.8 Total 688.0 381.0 252.9 224.9 Ash-Free Dry Weight (g/m²) 470.6 240.8 152.6 123.9 Belowground 143.6 63.6 70.0 59.2 Total 614.3 304.4 222.7 183.1 Ash-Weight (g/m²) Aboveground 18.3 40.0 9.8 12.6	Belowground	141.0	95.3	106.8	91.9	
Aboveground 876.0 976.9 1,333.6 1,277.5 Average 605.7 767.4 921.6 932.0 Wet Weight (g/m²) Aboveground 3,315.6 1,582.0 829.6 626.6 Belowground 1,365.2 737.0 663.7 476.8 Total 4,691.0 2,317.2 1,493.3 1,103.3 Dry Weight (g/m²) Aboveground 526.1 277.4 173.1 153.1 Belowground 161.9 103.6 79.8 71.8 Total 688.0 381.0 252.9 224.9 Ash-Free Dry Weight (g/m²) Aboveground 470.6 240.8 152.6 123.9 Belowground 143.6 63.6 70.0 59.2 Total 614.3 304.4 222.7 183.1 Ash-Weight (g/m²) Aboveground 55.4 36.6 20.4 29.2 Belowground 18.3 40.0 9.8 12.6 Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 3.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) Live 158 89 Calcium (mg/m²) Live 158 89 Calcium (mg/m²)	Total	319.7	230.5	194.7	180.3	
Belowground Average 876.0 976.9 1,333.6 1,277.5 Average 605.7 767.4 921.6 932.0 Wet Weight (g/m²) 3,315.6 1,582.0 829.6 626.6 626.6 8elowground 1,365.2 737.0 663.7 476.8 476.8 70tal 4,691.0 2,317.2 1,493.3 1,103.3 Dry Weight (g/m²) Aboveground 526.1 277.4 173.1 153.1 Belowground 161.9 103.6 79.8 71.8 Total 688.0 381.0 252.9 224.9 Ash-Free Dry Weight (g/m²) 470.6 240.8 152.6 123.9 Belowground 470.6 240.8 152.6 123.9 Belowground 443.6 63.6 70.0 59.2 Total 614.3 304.4 222.7 183.1 Ash-Weight (g/m²) 48.0 20.4 29.2 Belowground 18.3 40.0 9.8 12.6	Total Phosphorus (mg/kg)					
Average 605.7 767.4 921.6 932.0 Wet Weight (g/m²) Aboveground 3,315.6 1,582.0 829.6 626.6 626.6 626.6 626.6 626.7 476.8 737.0 663.7 476.8 476.8 70.0 63.7 476.8 476.8 70.0 526.1 277.4 173.1 153.1 153.1 152.1 153.1 152.1 153.1 153.1 153.1 153.1 153.1 153.1 153.1 153.1 153.1 153.1 153.1 152.6 79.8 71.8 71.8 71.8 70.1 70.8 71.8 71.8 71.8 70.1 70.8 71.8 71.8 71.8 70.1 70.8 71.8 71.8 71.8 70.8 71.8 71.8 71.8 70.8 71.8 71.8 71.8 70.8 71.8 71.8 70.8 71.8 71.8 70.8 71.8 71.8 71.8 70.8 72.2 72.4 91.8 12.6 123.9 80.0 80.0 80.0 80.0 80.0 80.0 80.0 80.0<	_					
Wet Weight (g/m²) Aboveground 3,315.6 1,582.0 829.6 626.6 Belowground 1,365.2 737.0 663.7 476.8 Total 4,691.0 2,317.2 1,493.3 1,103.3 Dry Weight (g/m²) Aboveground 526.1 277.4 173.1 153.1 Belowground 161.9 103.6 79.8 71.8 Total 688.0 381.0 252.9 224.9 Ash-Free Dry Weight (g/m²) 470.6 240.8 152.6 123.9 Belowground 143.6 63.6 70.0 59.2 Total 614.3 304.4 222.7 183.1 Ash-Weight (g/m²) Aboveground 55.4 36.6 20.4 29.2 Belowground 18.3 40.0 9.8 12.6 Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 3.48 4.49 0.94	Belowground					
Aboveground 3,315.6 1,582.0 829.6 626.6 Belowground 1,365.2 737.0 663.7 476.8 Total 4,691.0 2,317.2 1,493.3 1,103.3 Dry Weight (g/m²) Aboveground 526.1 277.4 173.1 153.1 Belowground 161.9 103.6 79.8 71.8 Total 688.0 381.0 252.9 224.9 Ash-Free Dry Weight (g/m²) Aboveground 470.6 240.8 152.6 123.9 Belowground 143.6 63.6 70.0 59.2 Total 614.3 304.4 222.7 183.1 Ash-Weight (g/m²) Aboveground 55.4 36.6 20.4 29.2 Belowground 18.3 40.0 9.8 12.6 Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 3.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) Live 158 89 Dead 364 119		605.7	767.4	921.6	932.0	
Belowground 1,365.2 737.0 663.7 476.8 Total 4,691.0 2,317.2 1,493.3 1,103.3 Dry Weight (g/m²) Aboveground 526.1 277.4 173.1 153.1 Belowground 161.9 103.6 79.8 71.8 Total 688.0 381.0 252.9 224.9 Ash-Free Dry Weight (g/m²) Aboveground 470.6 240.8 152.6 123.9 Belowground 143.6 63.6 70.0 59.2 Total 614.3 304.4 222.7 183.1 Ash-Weight (g/m²) Aboveground 55.4 36.6 20.4 29.2 Belowground 18.3 40.0 9.8 12.6 Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 3.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20	Wet Weight (g/m²)					
Total 4,691.0 2,317.2 1,493.3 1,103.3 Dry Weight (g/m²) Aboveground 526.1 277.4 173.1 153.1 Belowground 161.9 103.6 79.8 71.8 Total 688.0 381.0 252.9 224.9 Ash-Free Dry Weight (g/m²) Aboveground 470.6 240.8 152.6 123.9 Belowground 143.6 63.6 70.0 59.2 Total 614.3 304.4 222.7 183.1 Ash-Weight (g/m²) Aboveground 18.3 40.0 9.8 12.6 Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 3.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448<	•					
Dry Weight (g/m²) Aboveground 526.1 277.4 173.1 153.1 Belowground 161.9 103.6 79.8 71.8 Total 688.0 381.0 252.9 224.9 Ash-Free Dry Weight (g/m²) Aboveground 470.6 240.8 152.6 123.9 Belowground 143.6 63.6 70.0 59.2 Total 614.3 304.4 222.7 183.1 Ash-Weight (g/m²) Aboveground 55.4 36.6 20.4 29.2 Belowground 18.3 40.0 9.8 12.6 Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 3.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,3	<u> </u>					
Aboveground 526.1 277.4 173.1 153.1 Belowground 161.9 103.6 79.8 71.8 Total 688.0 381.0 252.9 224.9 Ash-Free Dry Weight (g/m²) Aboveground 470.6 240.8 152.6 123.9 Belowground 143.6 63.6 70.0 59.2 Total 614.3 304.4 222.7 183.1 Ash-Weight (g/m²) Aboveground 55.4 36.6 20.4 29.2 Belowground 18.3 40.0 9.8 12.6 Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 3.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) Live 158 89 Dead 364 119	Total	4,691.0	2,317.2	1,493.3	1,103.3	
Belowground 161.9 103.6 79.8 71.8 Total 688.0 381.0 252.9 224.9 Ash-Free Dry Weight (g/m²) Aboveground 470.6 240.8 152.6 123.9 Belowground 143.6 63.6 70.0 59.2 Total 614.3 304.4 222.7 183.1 Ash-Weight (g/m²) Aboveground 18.3 40.0 9.8 12.6 Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 3.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) 158 89 <	Dry Weight (g/m²)					
Total 688.0 381.0 252.9 224.9 Ash-Free Dry Weight (g/m²) Aboveground 470.6 240.8 152.6 123.9 Belowground 143.6 63.6 70.0 59.2 Total 614.3 304.4 222.7 183.1 Ash-Weight (g/m²) Aboveground 55.4 36.6 20.4 29.2 Belowground 1.83 40.0 9.8 12.6 Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 3.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground <th colspa<="" td=""><td>Aboveground</td><td>526.1</td><td>277.4</td><td>173.1</td><td>153.1</td></th>	<td>Aboveground</td> <td>526.1</td> <td>277.4</td> <td>173.1</td> <td>153.1</td>	Aboveground	526.1	277.4	173.1	153.1
Ash-Free Dry Weight (g/m²) Aboveground 470.6 240.8 152.6 123.9 Belowground 143.6 63.6 70.0 59.2 Total 614.3 304.4 222.7 183.1 Ash-Weight (g/m²) Aboveground 55.4 36.6 20.4 29.2 Belowground 18.3 40.0 9.8 12.6 Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 3.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) Live 158 89 Dead 364 119	Belowground	161.9		79.8		
Aboveground 470.6 240.8 152.6 123.9 Belowground 143.6 63.6 70.0 59.2 Total 614.3 304.4 222.7 183.1 Ash-Weight (g/m²) Aboveground 55.4 36.6 20.4 29.2 Belowground 18.3 40.0 9.8 12.6 Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 3.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) Live 158 89 Dead 364 119	Total	688.0	381.0	252.9	224.9	
Belowground 143.6 63.6 70.0 59.2 Total 614.3 304.4 222.7 183.1 Ash-Weight (g/m²) 304.4 222.7 183.1 Aboveground 55.4 36.6 20.4 29.2 Belowground 18.3 40.0 9.8 12.6 Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 3.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) 158 89 Dead 364 119	Ash-Free Dry Weight (g/m²)					
Total 614.3 304.4 222.7 183.1 Ash-Weight (g/m²) 55.4 36.6 20.4 29.2 Belowground 18.3 40.0 9.8 12.6 Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 3.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) Live 158 89 Dead 364 119	Aboveground	470.6	240.8	152.6	123.9	
Ash-Weight (g/m²) Aboveground 55.4 36.6 20.4 29.2 Belowground 18.3 40.0 9.8 12.6 Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 3.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) Live 158 89 Dead 364 119	Belowground	143.6	63.6	70.0	59.2	
Aboveground 55.4 36.6 20.4 29.2 Belowground 18.3 40.0 9.8 12.6 Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 3.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) 158 89 Dead 364 119	Total	614.3	304.4	222.7	183.1	
Belowground 18.3 40.0 9.8 12.6 Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 3.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) 158 89 Dead 364 119	Ash-Weight (g/m²)					
Total 73.7 76.7 30.2 41.8 Calcium (g/m²) Aboveground 3.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) 158 89 Dead 364 119	Aboveground	55.4	36.6	20.4	29.2	
Calcium (g/m²) Aboveground 3.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) Live 158 89 Dead 364 119	Belowground	18.3	40.0	9.8	12.6	
Aboveground 3.48 4.49 0.94 1.65 Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) Live 158 89 Dead 364 119	Total	73.7	76.7	30.2	41.8	
Belowground 1.32 6.52 0.45 0.54 Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) 158 89 Dead 364 119	Calcium (g/m²)					
Total 4.80 11.01 1.39 2.20 Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) Live 158 89 Dead 364 119	Aboveground	3.48	4.49	0.94	1.65	
Calcium (mg/kg) Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) Live 158 89 Dead 364 119	Belowground	1.32	6.52	0.45	0.54	
Aboveground 6,730 17,190 5,425 11,025 Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) Live 158 89 Dead 364 119	Total	4.80	11.01	1.39	2.20	
Belowground 7,448 60,300 5,600 7,560 Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) Live 158 89 Dead 364 119	Calcium (mg/kg)					
Average 7,119 30,602 5,500 9,767 Stem Counts (#/m²) Live 158 89 Dead 364 119	Aboveground	6,730	17,190	5,425	11,025	
Stem Counts (#/m²) Live 158 89 Dead 364 119	Belowground	7,448	60,300	5,600	7,560	
Live 158 89 Dead 364 119	Average	7,119	30,602	5,500	9,767	
Dead 364 119	Stem Counts (#/m²)					
	Live	158	89			
Total 522 208	Dead	364	119			
10141 022 200	Total	522	208			

Notes:

Number of replicates: PP-3 (3), PP-4 (3), PP-7 (1), PP-17 (1)

Stem counts made only in emergent vegetation.

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^{-- =} not sampled

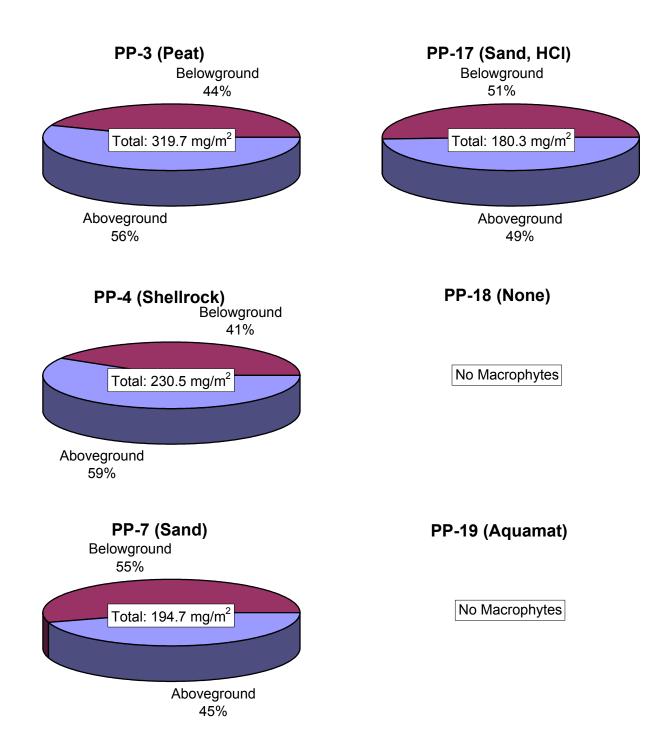
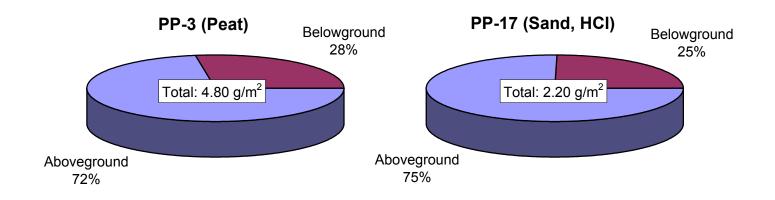
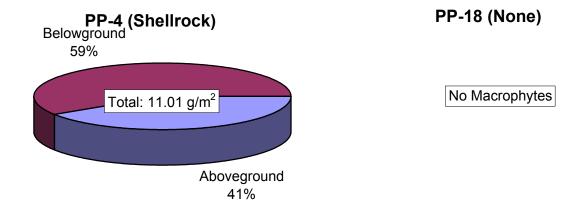


Exhibit 4-7TP Content for each Macrophyte Compartment for the Porta-PSTA Treatments





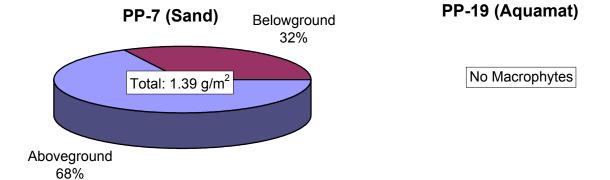


Exhibit 4-8Calcium Content for each Macrophyte Compartment for the Porta-PSTA Treatments

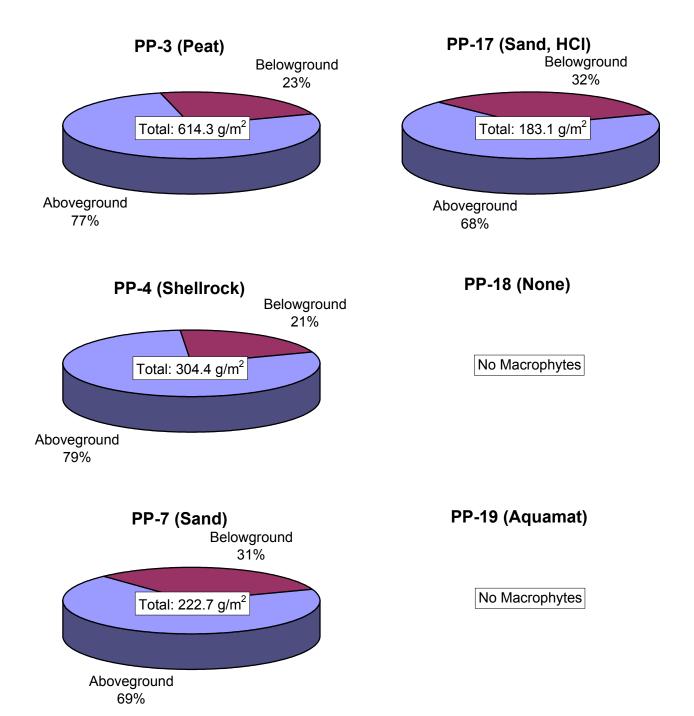


Exhibit 4-9Ash-Free Dry Weight Biomass for each Macrophyte Compartment for the Porta-PSTA Treatments

4.4 Consumers

Exhibits 4-10 and 4-11 summarize the average mass of TP, calcium, and carbon present in the consumers collected from each of the Porta-PSTAs at the time of sampling. Consumers collected from the Aquamat treatment had higher mass of TP, calcium, and AFDW biomass compared to the other treatments. Average consumer TP estimates from all treatments varied from 0.01 mg P/m² in the acid-rinsed sand treatment (PP-17) to 9.07 mg P/m² in the Aquamat treatment (PP-19). The acid-rinsed sand treatment also had the lowest consumer calcium content and AFDW biomass estimate (0.008 g Ca/m² and 0.02 g AFDW/m², respectively) in comparison with the other treatments. The Aquamat treatment had the highest consumer calcium content and AFDW biomass estimate (1.03 g Ca/m² and 2.01 g AFDW/m², respectively).

EXHIBIT 4-10Porta-PSTA Consumer Final Mass Balance Sampling, February 2001

	Treatment No.							
Soil Type Tank Bottom Area (m²)	PP-3 Peat 6	PP-4 Shellrock 6	PP-7 Sand 6	PP-17 Sand 6	PP-18 None 6	PP-19 Aquamat 6		
Total Phosphorus (mg/m²)	5.33	0.15	2.47	0.01	5.69	9.07		
Total Phosphorus (mg/kg)	2402.1	570.7	4066.7	160.6	1466.3	2714.5		
Calcium (g/m²)	0.19	0.03	0.089	0.008	0.767	1.031		
Calcium (mg/kg)	112595	90320	146336	175425	197518	308686		
Wet Weight (g/m ²)	22.50	12.39	15.50	6.50	24.83	26.50		
Dry Weight (g/m²)	1.18	0.30	0.61	0.04	3.88	3.34		
Ash Weight (g/m²)	0.24	0.19	0.34	0.02	2.55	1.33		
Ash-Free Dry Weight (g/m²)	0.94	0.12	0.27	0.02	1.33	2.01		

4.5 Sediments

Exhibit 4-12 summarizes the average mass of TP, calcium, percent solids, and bulk density in the upper soil layer (0 to 10 cm) and lower soil layer (10 to 20 cm) for each Porta-PSTA at the time of sampling.

Exhibit 4-13 illustrates the total mass of soil TP and the percentage found in the upper and lower layers for each of the treatments. There was generally little difference in soil TP content between the two layers for each treatment. The peat treatment (PP-3) had slightly higher TP levels in the lower soil layer (5,572 mg P/m²) than in the surface layer (3,887 mg P/m²). The shellrock treatment (PP-4) had a higher total soil TP (270,701 mg P/m²) than in the peat (9,460 mg P/m²), and sand treatments (PP-7 at 5,625 mg P/m² and PP-17 5,675 mg P/m²).

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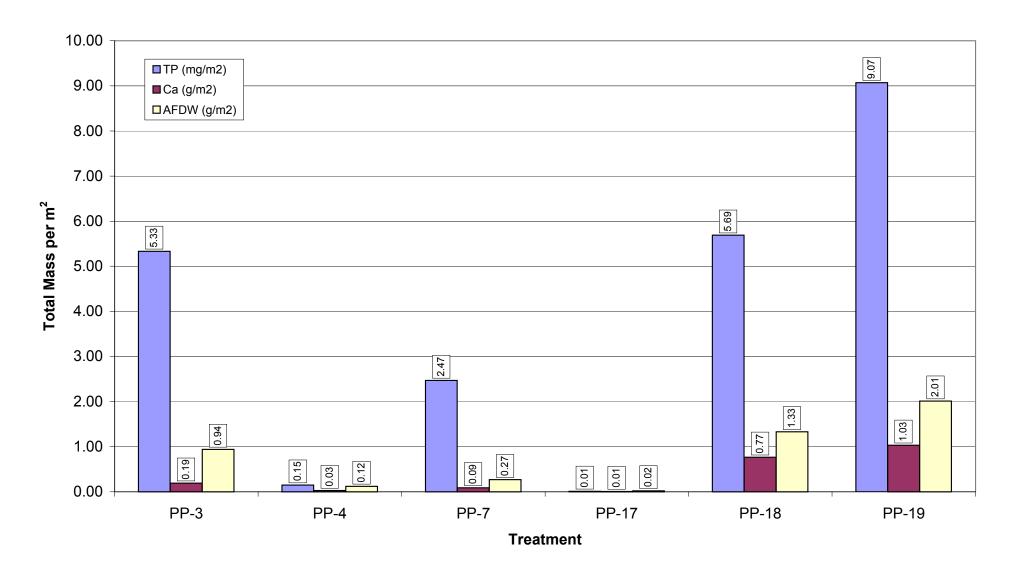


Exhibit 4-11Total Mass of TP, Calcium, and Ash-Free Dry Weight Biomass Estimated in Consumers Collected from Porta-PSTA Mesocosms

Exhibit 4-12
Porta-PSTA Soil Final Mass Ralance Sampling February 2001

Treatment No.	PP-3	PP-4	PP-7	PP-17
Soil Type	Peat	Shellrock	Sand	Sand
Tank Bottom Area (m²)	6	6	6	6
Total Phosphorus (mg/m²)				
Upper (0-10 cm)	3,887	137,195	3,176	2,463
Lower (10-20 cm)	5,572	133,506	2,450	3,212
Total	9,460	270,701	5,625	5,675
Total Phosphorus (mg/kg)				
Upper (0-10 cm)	122.13	996.10	23.88	18.41
Lower (10-20 cm)	135.80	925.17	16.28	20.34
Average (0-20 cm)	128.97	960.63	20.08	19.37
TIP (mg/m ²)				
Upper (0-10 cm)	3,244	128,592	1,384	1,361
Lower (10-20 cm)	3,926	127,306	1,356	1,086
Total	7,170	255,899	2,740	2,447
TIP (mg/kg)				
Upper (0-10 cm)	93.70	970.54	10.48	9.79
Lower (10-20 cm)	94.83	905.41	9.17	6.83
Average (0-20 cm)	94.26	937.97	9.83	8.31
Calcium (g/m²)				
Upper (0-10 cm)	4,028	19,879	744	83
Lower (10-20 cm)	4,702	23,784	90	133
Total	8,730	43,663	834	216
Calcium (mg/kg)				
Upper (0-10 cm)	130,465	143,833	5,595	624
Lower (10-20 cm)	114,600	163,833	597	844
Average (0-20 cm)	122,533	153,833	3,096	734
Percent Solids				
Upper (0-10 cm)	28.32	68.83	73.45	83.20
Lower (10-20 cm)	28.22	79.00	80.90	80.20
Average (0-20 cm)	28.27	73.92	77.18	81.70
Dry Bulk Density (g/cm³)				
Upper (0-10 cm)	0.32	1.38	1.33	1.34
Lower (10-20 cm)	0.41	1.45	1.51	1.58
Average (0-20 cm)	0.36	1.41	1.42	1.46

Number of replicates: PP-3 (3), PP-4 (3), PP-7 (1), PP-17 (1)

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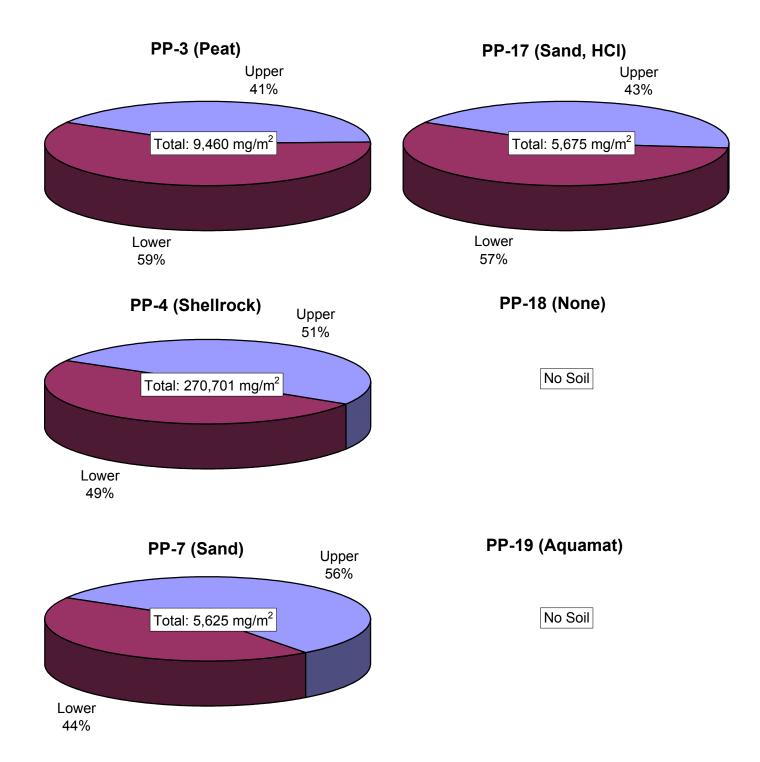


Exhibit 4-13Total Phosphorus Content from the Upper (0-10 cm) and Lower (10-20 cm) Soil Layers in the Porta-PSTA Treatments

Exhibit 4-14 displays the average total calcium content and the percentage found in the upper and lower soil layers sampled in each of the treatments. The calcium content was estimated at relatively equal proportions in the upper and lower layers for both the peat and shellrock treatments, with the highest total soil calcium from the shellrock treatment (PP-4 at 43,663 g Ca/m^2). The acid-rinsed sand treatment had higher calcium levels in the lower level (62 percent of total), with the lowest total soil calcium level (216 g Ca/m^2) of all measured treatments. The "non-rinsed" sand treatment had higher calcium levels in the upper soil layer (89 percent of total), with total calcium content in both layers of 834 g Ca/m^2 .

Exhibit 4-15 illustrates the average soil bulk density for each treatment by soil layer. There was no apparent difference between the upper and lower soil bulk densities for each of the treatments sampled. The average bulk density for the peat treatment was the lowest at $0.36~\rm g/cm^3$, while the shellrock and sand treatments ("non-rinsed" and acid-rinsed) were generally the same, with average bulk densities of 1.41, 1.42, and 1.46 $\rm g/cm^3$ for PP-4, PP-7, and PP-17, respectively.

4.6 Endwall Diatom Taxonomy

Exhibits 4-16 and 4-17 display a summary of diatom (phylum: Bacillariophyceae) occurrence and density, respectively, on the Porta-PSTA tank downstream endwalls at the time of sampling. The most common species observed within all sampled treatments were *Mastogloia* spp., *Fragilaria* spp., and *Achnanthes* spp. The average diatom density was greatest in the shellrock treatments, with tank 3 having the highest density (366,556 cells/cm² of sampled wall area), followed by the sand treatment (PP-7 at 128,685 cells/cm²). The lowest average density was observed in the peat treatments, with tank 12 having the lowest density (2,990 cells/cm²).

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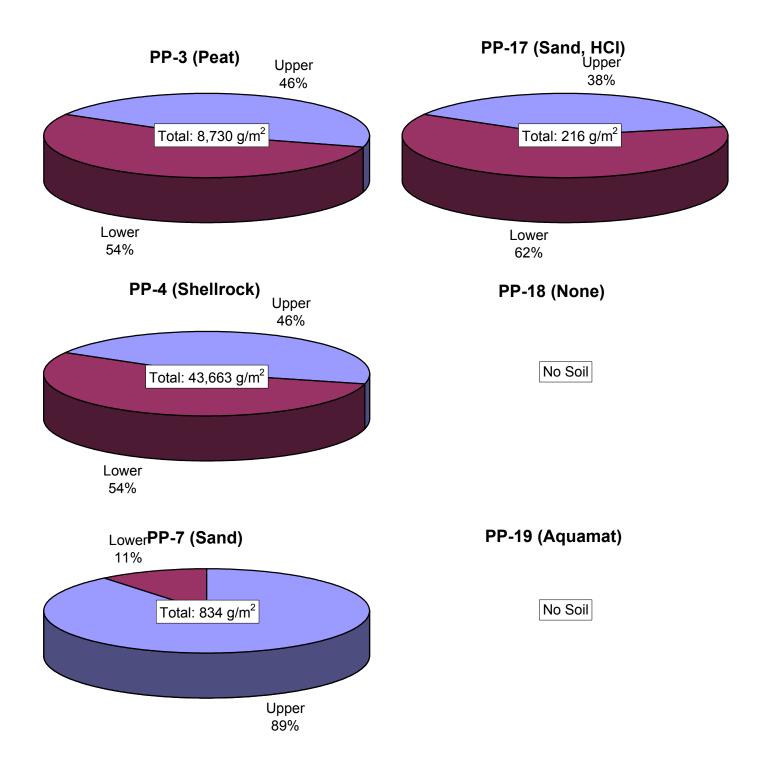


Exhibit 4-14Calcium Content from the Upper (0–10 cm) and Lower (10–20 cm) Soil Layers in the Porta-PSTA Treatments

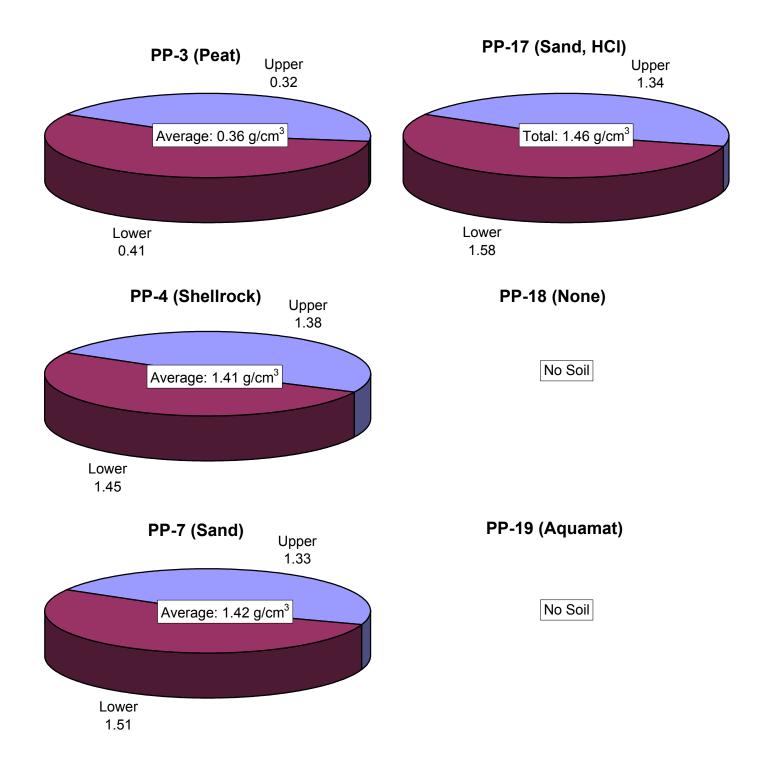


Exhibit 4-15
Bulk Density (g/cm³) for the Upper (0–10 cm) and Lower (10–20 cm) Soil Layers in the Porta-PSTA Treatments

Exhibit 4-16
Diatom Occurrence on Porta-PSTA Downstream Endwalls, February 2001

	Number of										
Treatment Number	Species		PP-3			PP-4		PP-7	PP-17	PP-18	PP-19
Tank Number	Included	12	14	17	3	5	10	19	20	21	22
Achnanthes spp.	2	62.2	28.0	39.7	2.0	11.8	6.5	4.1	34.0	0.0	2.9
Amphipleura, spp.	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0
Brachysira, spp.	2	1.4	8.0	2.8	9.4	3.3	4.0	0.5	0.0	0.4	0.8
Cyclotella, spp.	1	1.4	0.4	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Cymbella, spp.	2	5.5	12.1	4.9	14.2	18.3	5.1	13.6	11.9	11.6	5.5
Diploneis, spp.	2	1.4	1.2	0.7	0.8	1.2	0.4	0.2	0.0	0.2	0.2
Encyonema, spp.	6	6.8	4.7	4.2	19.8	49.2	10.1	11.1	15.3	14.7	9.2
Eunotia, spp.	2	1.4	3.9	0.7	0.4	0.8	2.0	0.0	0.0	0.0	0.0
Fragilaria, spp.	4	0.0	18.7	26.2	18.2	7.3	28.9	20.2	20.8	13.9	35.7
Gomphonema, spp.	4	5.5	3.5	2.1	1.2	0.4	1.2	0.4	2.0	0.6	2.0
Gyrosigmas, spp.	1	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mastogloia, spp.	3	6.8	9.3	11.3	29.8	3.9	24.3	46.8	2.5	49.0	34.4
Navicula, spp.	4	0.0	4.7	0.0	0.6	0.6	0.0	0.5	3.7	2.4	8.0
Nitzschia, spp.	8	8.2	11.7	6.4	3.5	3.5	17.4	1.8	9.6	7.3	7.9
Rhopalodia, spp.	1	0.0	1.2	0.7	0.0	0.0	0.2	0.4	0.0	0.0	0.0
Sellaphora, spp.	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
Total		101	100	100	100	100	100	100	100	100	100
Number of Taxa	44	22	23	22	23	19	20	21	19	19	21
Shannon-Weaver Index		2.50	3.43	2.87	3.13	2.58	3.05	2.48	3.11	2.61	2.71
Evenness (H-Hmin)/(Hm	ax-Hmin)	0.456	0.732	0.598	0.658	0.572	0.676	0.520	0.707	0.578	0.577

Number of replicates: PP-3 (3), PP-4 (3), PP-7 (1), PP-17 (1), PP-18 (1), PP-19 (1)

EXHIBIT 4-17Diatom Density on Porta-PSTA Downstream Endwalls, February 2001

			Cells	s/cm ²	
Treatment #	Tank	Soil Type	Alive	Dead	Total Number Organisms
PP-4	3	shell	277,473	89,084	366,556
PP-4	5	shell	5,902	2,208	8,110
PP-4	10	shell	28,150	14,786	42,935
PP-3	12	peat	1,993	997	2,990
PP-3	14	peat	6,821	3,816	10,637
PP-3	17	peat	4,640	1,664	6,304
PP-7	19	sand	99,307	29,378	128,685
PP-17	20	sand	22,650	6,960	29,610
PP-18	21	none	10,673	9,139	19,812
PP-19	22	Aquamat	58,124	30,376	88,500

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Discussion and Conclusions

Discussion and Conclusions

Final mass balance sampling (biomass, P, and calcium) was conducted on 10 of the 24 Porta-PSTA tanks in February 2001. Mass balances are itemized in Section 4 for periphyton components (floating/metaphyton, benthic, and wall), macrophytes (above- and belowground), consumers, soils (two depth increments), and water. Of particular interest to the evaluation of the proposed PSTA technology for water quality treatment is the fate of P in these mesocosms. This section briefly compares the estimated mass of P removed during the Porta-PSTA study to the amount quantified at this final mass balance sampling. Quantities of biomass and calcium that accumulated in these test systems were also estimated and described below.

Exhibit 5-1 summarizes the estimated mass of TP loaded to and removed from each of the Porta-PSTA treatments evaluated in this report. These amounts were estimated based on detailed mass balance sampling from April 1999 through early October 2000 in these treatments and have been extrapolated assuming the same inflow and outflow rates and TP concentrations through the beginning of the mass balance sampling on February 13, 2001.

EXHIBIT 5-1Porta-PSTA Water Mass Balance Estimates, April 1999–February 2001

		TP (ı	mg/L)	- Inflow	Outflow	MB_TP	(mg/m²)	Removal	
Treatment	Number of days	Inflow	Outflow	(m³/d)	(m³/d)	Inflow	Outflow	(mg/m ²)	(%)
PP-3	673	0.026	0.018	0.44	0.42	1242	786	456	36.7
PP-4	673	0.026	0.016	0.45	0.46	1274	809	464	36.4
PP-7	673	0.026	0.017	0.44	0.42	1267	783	484	38.2
PP-17	302	0.031	0.014	0.45	0.48	728	338	390	53.6
PP-18	302	0.031	0.017	0.48	0.55	705	455	250	35.5
PP-19	302	0.031	0.015	0.48	0.52	701	398	303	43.2

Removal of TP was estimated between 456 and 484 mg P/m^2 for the three treatments that were conducted for the full 18-month study period and between 250 and 390 mg P/m^2 for the treatments that were conducted during the 6-month Phase 2 period only. Treatments PP-3, PP-4, and PP-7 underwent significant initial releases of TP during their startup in April and May 1999. The mass balances in Exhibit 5-1 for PP-17 do not reflect an initial period of P release from newly flooded soils, and PP-18 and PP-19 had no soils.

Exhibit 5-2 summarizes the total biomass (AFDW) and TP measured in these same treatments as part of this study. In several of the treatments (PP-3, PP-17, PP-18, and PP-19), the amount of TP that has accumulated in the biotic components of periphyton, macrophytes, and consumers is approximately equal to the total mass of TP removed from the water column. More TP is in the biomass than was removed from the water column in two of the treatments (PP-4 [shellrock soils] with 464 mg P/m^2 removed compared to 626 mg P/m^2 in

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biomass and treatment PP-7 [un-rinsed sand] with 484 mg P/m^2 removed from the water compared to 828 mg P/m^2 in the final biomass). One possible explanation for this higher TP mass is that some of the net TP accumulation in the biomass was derived from the soil TP compartment.

EXHIBIT 5-2Porta-PSTA Final Mass Balance Sampling, February 2001

Treatment Number Substrate	PP-3 Peat	PP-4 Shell	PP-7 Sand	PP-17 Sand	PP-18 None	PP-19 Aquamat
Biomass (g AFDW/m²)						
Periphyton	78	215	249	177	296	309
Macrophytes	614	304	223	183	0	0
Consumers	0.9	0.1	0.3	0.0	1.3	2.0
Total	693	519	472	360	297	311
Total Phosphorus (mg/m²)						
Water	6.1	4.1	4.0	6.9	3.4	3.6
Periphyton	95	391	626	220	184	273
Macrophytes	320	230	195	180	0	0
Consumers	5.3	0.1	2.5	0.0	5.7	9.1
Total	426	626	828	407	193	285

Clearly the soil TP compartment overshadows the biotic TP compartments in the Porta-PSTA treatments evaluated in this study. The soil is likely to be the principal source of nutrients for the rooted macrophytic plants but not for periphyton. Changes in soil TP content through the period of the entire 18-month study and differences between the lower and upper soil level TP concentrations will be examined in the PSTA Research and Demonstration Project final report to further elucidate the transfer of P between the biotic and abiotic components. Inclusion of non-soil Porta-PSTA treatments in this study has helped to confirm that TP removal can be effective through the action of periphyton biotic uptake alone.

Biomass sampling determined that macrophytes were the dominant reserve of new organic matter in the Porta-PSTAs at the end of this study. The macrophyte biomass (614 g AFDW/m²) overshadowed the periphyton biomass(78 g AFDW/m²) in the peat-based mesocosms, while in the shellrock and sand mesocosms, the amount of biomass in each compartment was approximately equal (approximately 180 to 300 g AFDW/m² for each compartment). Periphyton biomass in the shellrock and sand treatments was slightly less than the periphyton biomass that accumulated in the non-soil control tanks that had no competing macrophytes (296 to 309 g AFDW/m²). Clearly, macrophyte dominance in the peat mesocosms limited the sustainable amount of periphyton biomass. However, when macrophyte biomass was relatively sparse because of less favorable soils, there was a favorable and nearly even split between macrophyte and periphyton biomass. Consumer

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biomass was negligible compared to plant biomass in all treatments (1.3 g AFDW/m² or less).

The calcium content of the PSTA soils appeared to have little effect on the calcium content in the periphyton. Shellrock soils had a calcium concentration of approximately 15 percent and periphyton had approximately 22 percent. Peat soils averaged 12 percent calcium, and the periphyton in the peat mesocosms averaged 15 percent%. The sand soils had 0.3% calcium and the acid-rinsed sand soils had 0.07% calcium, yet periphyton in these tanks both had about 11% calcium. The non-soil control tank periphyton had about 23 to 24% calcium. These data indicate that calcium was principally accumulated in the periphyton from the water column rather than from the soils.

DFB/16613.DOC 5-3

References

SECTION 6

References

CH2M HILL. June 2001. *PSTA Research and Demonstration Project Phase 2 Interim Report*. April 2000-December 2000. June 2001.

CH2M HILL. April 2001. Periphyton-Based Stormwater Treatment Area (PSTA) Research and Demonstration Project PSTA Research Plan, Revision No. 3. April 2001.

CH2M HILL. August 2000. *PSTA Research and Demonstration Project Phase 1 Summary Report*. February 1999 to March 2000. August 2000.

CH2M HILL. February 2001. *Periphyton-Based Stormwater Treatment Area Research and Demonstration Project Porta-PSTA Mass Balance (Destructive) Sampling Plan.* February 2001.

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Detailed Porta-PSTA Destructive Summaries

Appendix A-1
Porta-PSTA Final Samoling Summary of Peal-Based Treatment (PP-3)

-		12			Tank No.	———— <u> </u>		17	
Soli Tura	Rep 1 Peat	Rep 2 Peat	Average Peat	Rep 1 Peat	Rep 2 Peat	Average Peat	Rep 1 Peat	Rep 2 Peat	Average Peat
Soil Type Tank Bottom Area (m²)	6	6	6	6	6	6	6	6	6
Water Depth (m)	0.27	0.27	0.27	0.31	0.31	0.31	0.34	0.34	0.34
Inflow Phosphorus, Water (g/m³)			***************************************						
TP	0.020		0.020	0.020	-	0.020	0.020		0.020
TDP	0.009		0.009	0.009	-	0.009	0.009		0.009
SRP	0.006		0.006	0.006		0.006	0.006		0.006
DOP	0.004		0.004	0.004		0.004	0.004		0.004
TPP	0.010		0.010	0.010	-	0.010	0.010		0.010
Outflow Phosphorus, Water (g/m3))								
TP	0.037		0.037	0.013		0.013	0.012	-	0.012
TDP	0.009		0.009	0.006		0.006	0.008	-	0.008
SRP	0.001	-	0.001	0.004		0.004	0.004		0.004
DOP	0.008	-	0.008	0.002	**	0.002	0.004 0.004		0.004 0.004
TPP	0.028	••	0.028	0.007		0.007	0.004		0.004
Phosphorus, Water (mg/m²)	10.11		10.14	200		3.98	4.05	_	4.05
TP	10.14 2.47	-	10.14 2.47	3.98 1.83		1.83	2.70	-	2.70
TDP SRP	0.27	-	0.27	1.22	-	1.22	1.35	-	1.35
DOP	2.19	-	2.19	0.61		0.61	1.35	-	1.35
TPP	7.67	-	7.67	2.14		2.14	1.35		1.35
_	7.07		7.07			2			
Periphyton (g DW/m²) Floating Mat/Metaphyton	0.00	0.00	0.00	74.66	70.58	72.62	3.14	2.68	2.91
Benthic Mat	0.00	0.00	0.00	163.99	143.32	153.66	134.05	112.85	123.45
Wall Mat	12.04	15.42	13.73	30.99	29.75	30.37	4.40	10.63	7.51
Total	12.04	15.42	13.73	269.64	243.65	256.64	141.60	126.16	133.88
Periphyton (g wet/m²)									
Floating Mat/Metaphyton	0.00		0.00	1522.81		1522.81	81.33		81.33
Benthic Mat	0.00		0.00	3085.22		3085.22	1334.23		1334.23
Wall Mat	48.83	-	48.83	460.14		460.14	59.67		59.67
Total	48.83		48.83	5068.18		5068.18	1475.23	-	1475.23
Periphyton (g AFDW/m²)				l					
Floating Mat/Metaphyton	0.00	0.00	0.00	38.22	37.72	37.97	1.06	0.90	0.98
Benthic Mat	0.00	0.00	0.00	107.46	97.91	102.68	78.99	65.42	72.20
Wall Mat	3.47	4.38	3.93	13.83	13.69	13.76	1.58	3.45	2.51
Total	3.47	4.38	3.93	159.51	149.31	154.41	81.64	69.77	75.70
Periphyton (g ash/m²)				İ					
Floating Mat/Metaphyton	0.00	0.00	0.00	36.44	32.86	34.65	2.08	1.78	1.93
Benthic Mat	0.00	0.00	0.00	56.54	45.41	50.97	55.06	47.43	51.25
Wall Mat	8.58	11.04	9.81	17.16	16.06	16.61	2.82	7.18	5.00
Total	8.58	11.04	9.81	110.13	94.33	102.23	59.96	56.39	58.18
Periphyton TP (mg/m²)									
Floating Mat/Metaphyton	0.00	0.00	0.00	53.89	48.72	51.30	1.40	1.06	1.23
Benthic Mat	0.00	0.00	0.00	126.64	107.66	117.15	104.72	73.08	88.90
Wall Mat	2.85	3.91	3.38	18.24	18.43	18.33	2.81	6.82	4.81
Total	2.85	3.91	3.38	198.78	174.81	186.79	108.93	80.97	94.95
Periphyton TP (mg/kg)					600.05	700.05	440.00	396.49	421.56
Floating Mat/Metaphyton		-	-	721.84	690.25 751.19	706.05 761.72	446.62 781.20	647.61	714.41
Benthic Mat	236.39	 		772.24 588.64	619.41	604.03	637.33	641.76	639.54
Wall Mat	236.39	253.58 253.58	244.98 246.04	737.19	717.45	727.82	769.30	641.78	709.22
Average Periphyton TIP (mg/m²)	230.39	255.56	240.04	/3/.13	717.43	727.02	700.00	0410	, 00.22
Floating Mat/Metaphyton	0.00	0.00	0.00	7.65	8.36	8.00	0.13	0.15	0.14
Benthic Mat	0.00	0.00	0.00	19.59	24.00	21.79	15.49	12.55	14.02
Wali Mat	0.64	0.59	0.62	2.28	2.57	2.43	0.65	0.90	0.77
Total	0.64	0.59	0.62	29.52	34.92	32.22	16.26	13.59	14.93
Periphyton TIP (mg/kg)	0.01	0.00	0.02						
Floating Mat/Metaphyton				102.42	118.39	110.40	40.27	54.16	47.21
Benthic Mat				119.46	167.43	143.45	115.52	111.23	113.37
Wall Mat	53.55	38.53	46.04	73.51	86.46	79.98	146.49	84.28	115.39
Average	53.55	38.53	45.11	109.46	143.34	125.54	114.81	107.75	111.48
Periphyton Ca (g/m²)									
Floating Mat/Metaphyton	0.00	0.00	0.00	16.94	6.60	11.77	0.51	0.85	0.68
Benthic Mat	0.00	0.00	0.00	15.36	9.42	12.39	9.19	9.62	9.41
Wall Mat	2.77	4.12	3.45	5.75	5.95	5.85	0.54	2.73	1.63
Total	2.77	4.12	3.45	38.05	21.97	30.01	10.23	13.21	11.72
Periphyton Ca (mg/kg)									
Floating Mat/Metaphyton		-		226962	93522	160242	160769	318018	239394
Benthic Mat		_		93643	65698	79670	68544	85281	76912
Wall Mat	229969	267303	248636	185441	200000	192720	122283	256757	189520
Average	229969	267303	250938	141107	90156	116922	72263	104674	87534
Macrophyte TP (mg/m²)	040 1-	050.10	050.00	100 10	100.00	100.00	170 44	140.00	157.00
Aboveground	248.17	259.10	253.63	139.13	108.68	123.90	173.41	142.23	157.82 50.75
Belowground	212.44	258.54	235.49	163.89	90.68	127.28	67.51	51.98	59.75 217.57
Total	460.62	517.64	489.13	303.02	199.36	251.19	240.92	194.21	217.57

Appendix A-1
Porta-PSTA Final Sampling Summary of Peat-Based Treatment (PP-3)

		12			Tank No.			17	
	Rep 1	Rep 2	Average	Rep 1	Rep 2	Average	Rep 1	Rep 2	Average
Soil Type	Peat	Peat	Peat	Peat	Peat	Peat	Peat	Peat	Peat
Tank Bottom Area (m²)	6	6	6	6	6	6	6	6 0.34	6 0.34
Water Depth (m) Macrophyte TP (mg/kg)	0.27	0.27	0.27	0.31	0.31	0.31	0.34	0.34	0.34
Aboveground	402.9	441.1	422.0	297.1	243.6	270.3	383.5	243.6	313.6
Belowground	1185.2	1554.2	1369.7	660.2	432.5	546.4	775.8	648.3	712.0
Average	794.0	997.6	895.8	478.7	338.0	408.3	579.7	445.9	512.8
Macrophyte (g wet/m²)									
Aboveground	2437.6		2437.6	3914.0	-	3914.0	3595.2	-	3595.2
Belowground	1175.3	••	1175.3	2182.8 6110.1	-	2182.8 6110.1	737.5 4342.1		737.5 4342.1
Total	3620.8		3620.8	0110.1	-	6110.1	4342.1	-	4542.1
Macrophyte (g DW/m²) Aboveground	616.0	587.4	601.7	468.3	446.1	457.2	452.2	583.9	518.0
Belowground	179.2	166.3	172.8	248.2	209.7	228.9	87.0	80.2	83.6
Total	795.3	753.7	774.5	716.6	655.8	686.2	539.2	664.1	601.6
Macrophyte (g AFDW/m²)						3			
Aboveground	553.8	521.6	537.7	424.3	400.6	412.5	397.4	523.7	460.6
Belowground	161.7	152.5	157.1	212.2	188.5	200.4	76.8	69.3	73.1
Total	715.5	674.1	694.8	636.5	589.1	612.8	474.3	593.0	533.7
Macrophyte (g ash/m²)	60.0	65.0	64.0	44.0	45 5	44.0	54.7	60.1	57.4
Aboveground Belowground	62.2 17.6	65.8 13.8	64.0 15.7	44.0 36.0	45.5 21.2	44.8 28.6	54.7 10.2	10.9	57.4 10.5
Total	17.6 79.8	13.8 79.6	15.7 79.7	80.0	66.7	73.3	64.9	71.0	68.0
Macrophyte Ca (g/m²)	, 3.0	, 3.0	. 3.1	55.5	JJ.,	. 5.0	2 7.0		30.0
Aboveground	3.42	3.23	3.32	2.41	2.50	2.45	5.20	4.14	4.67
Belowground	0.80	0.80	0.80	3.13	2.12	2.62	0.38	0.67	0.52
Total	4.22	4.03	4.13	5.53	4.62	5.08	5.58	4.81	5.19
Macrophyte Ca (mg/kg)									
Aboveground	5550	5500	5525	5140	5600	5370	11500	7090	9295
Belowground	4460	4830	4645	12600	10100	11350	4340	8360	6350
Average	5304	5352	5328	7724	7039	7397	10344	7243	8633
Consumers TP (mg/m²)	15 16		15.16	0.02		0.02	0.81		0.81
TP (mg/kg)	15.16 5016.0	_	5016.0	209.7	-	209.7	1980.7	-	1980.7
Ca (g/m²)	0.532		0.532	0.015		0.015	0.010		0.010
Ca (mg/kg)	175871		175871	137353		137353	24561	-	24561
Wet Weight (g/m²)	46.83		46.83	12.67		12.67	8.00		8.00
Dry Weight (g/m²)	3.02		3.02	0.11		0.11	0.41		0.41
Ash Weight (g/m²)	0.33		0.33	0.03		0.03	0.35		0.35
AFDW (g/m²)	2.70		2.70	0.08		0.08	0.06		0.06
Soil TP (mg/m²)									
Upper (0-10 cm)	5013	3176	4095	4229	2853	3541	4233	3818	4026
Lower (10-20 cm)	6051	5732	5891	6097	5310	5703	5556	4689	5123
Total	11064	8908	9986	10326	8163	9245	9790	8507	9148
Soil TP (mg/kg)	404.0	440.4	400.7	100.0	00.5	407.0	141.1	131.7	136.4
Upper (0-10 cm)	131.9 144.1	113.4 139.8	122.7 141.9	128.2 148.7	86.5 129.5	107.3 139.1	135.5	117.2	126.4
Lower (10-20 cm) Average (0-20 cm)	138.0	126.6	132.3	138.4	108.0	123.2	138.3	124.4	131.4
Soil TIP (mg/m²)	100.0	120.0	102.0			1-0			
Upper (0-10 cm)	5538		5538	1471		1471	2723	-	2723
Lower (10-20 cm)	4829		4829	3347		3347	3603	-	3603
Total	10367	-	10367	4818		4818	6326		6326
Soil TIP (mg/kg)									
Upper (0-10 cm)	145.7		145.7	44.6		44.6	90.8	-	90.8
Lower (10-20 cm)	115.0	-	115.0	81.6		81.6	87.9	-	87.9
Average (0-20 cm)	130.4		130.4	63.1		63.1	89.3		89.3
Soil Ca (g/m²) Upper (0-10 cm)	334	3668	2001	667	9735	5201	7740	2024	4882
Lower (10-20 cm)	4662	5084	4873	3883	3719	3801	7134	3728	5431
Total	4996	8752	6874	4549	13454	9002	14874	5752	10313
Soil Ca (mg/kg)			•						
Upper (0-10 cm)	8790	131000	69895	20200	295000	157600	258000	69800	163900
Lower (10-20 cm)	111000	124000	117500	94700	90700	92700	174000	93200	133600
Average (0-20 cm)	59895	127500	93698	57450	192850	125150	216000	81500	148750
Soil Percent Solids	07.0	04.0	04.6	22.4	20.0	20.0	20.4	22.7	20.6
Upper (0-10 cm) Lower (10-20 cm)	27.6 26.6	21.6 27.0	24.6 26.8	23.4 27.9	38.2 22.6	30.8 25.3	36.4 28.0	22.7 37.2	29.6 32.6
Average (0-20 cm)	27.1	24.3	25.7	25.7	30.4	28.0	32.2	30.0	31.1
Soil Dry Bulk Density (g/cm ³)		_ 7.0			J-97			20.0	J
Upper (0-10 cm)	0.380	0.280	0.330	0.330	0.330	0.330	0.300	0.290	0.295
Lower (10-20 cm)	0.420	0.410	0.415	0.410	0.410	0.410	0.410	0.400	0.405
Average (0-20 cm)	0.400	0.345	0.373	0.370	0.370	0.370	0.355	0.345	0.350

Note: -- = no data

Appendix A-2
Porta-PSTA Final Sampling Summary of Shellrock-Based Treatment (PP-4)

		3			Tank No. 5		10			
	Rep 1	Rep 2	Average	Rep 1	Rep 2	Average	Rep 1	Rep 2	Average	
Soil Type	Shell	Shell	Shell	Shell	Shell	Shell	Sheli	Shell	Shell	
Tank Bottom Area (m²)	6	6	6	6	6	6	6	6	6	
Water Depth (m)	0.37	0.37	0.37	0.38	0.38	0.38	0.36	0.36	0.36	
Inflow Phosphorus, Water (g/m	3)	-								
TP	0.020		0.020	0.020		0.020	0.020		0.020	
TDP	0.009		0.009	0.009		0.009	0.009	-	0.009	
SRP	0.006		0.006	0.006		0.006	0.006		0.006	
DOP	0.004		0.004	0.004		0.004	0.004		0.004	
TPP	0.010	-	0.010	0.010		0.010	0.010		0.010	
Outflow Phosphorus, Water (g/										
TP	0.010		0.010	0.013		0.013	0.010		0.010	
TDP	0.007		0.007	0.008		0.008	0.006		0.006	
SRP	0.003		0.003	0.003	-	0.003	0.002		0.002	
DOP	0.004		0.004	0.005	-	0.005	0.004		0.004 0.004	
TPP	0.003	-	0.003	0.005		0.005	0.004	-	0.004	
Phosphorus, Water (mg/m²)			0.75	4.00		4.00	0.60		3.63	
TP	3.75	-	3.75	4.93	-	4.93	3.63		2.18	
TDP	2.62		2.62	3.03		3.03	2.18		0.73	
SRP	1.12	••	1.12	1.14		1.14 1.89	0.73 1.45	-	1.45	
DOP	1.50		1.50	1.89		1.89	1.45	-	1.45	
TPP	1.12		1.12	1.89		1.09	1.45	-	1.45	
Periphyton (g DW/m²)	070 40	200.04	250 45	48.94	52.17	50.56	169.07	178.41	173.74	
Floating Mat/Metaphyton	278.10	222.81	250.45			570.03	395.83	411.64	403.73	
Benthic Mat	697.14	669.43 236.23	683.29	475.78 53.77	664.29 64.23	59.00	243.63	232.00	237.82	
Wall Mat	282.57 1257.81	230.23 1128.47	259.40 1193.14	53.77 578.49	780.69	679.59	808.53	822.05	815.29	
Total	1257.01	1120.47	1193.14	3/0.49	700.09	079.39	000.55	022.03	013.23	
Periphyton (g wet/m²)	5100.00		5103.33	813.33		813.33	3446.67		3446.67	
Floating Mat/Metaphyton	5103.33 8693.33		8693.33	3515.00	-	3515.00	6728.33		6728.33	
Benthic Mat Wall Mat	3478.33	-	3478.33	870.00		870.00	2933.33		2933.33	
Total	17275.00	-	17275.00	5198.33		5198.33	13108.33		13108.33	
	17273.00	-	17275.00	3130.55		3130.00	10100.00		.0.00.00	
Periphyton (g AFDW/m²)	72.03	54.18	63.10	12.77	13.29	13.03	42.58	45.34	43.96	
Floating Mat/Metaphyton Benthic Mat	145.81	130.78	138.30	103.33	109.66	106.50	113.36	127.43	120.39	
Wall Mat	77.51	64.33	70.92	14.64	17.22	15.93	74.78	69.11	71.94	
Total	295.35	249.30	272.32	130.74	140.17	135.45	230.71	241.88	236.30	
Periphyton (g ash/m²)	233.55	240.00	272.02	100.74	140.11	100.40	200.7	2		
Floating Mat/Metaphyton	206.07	168.34	187.21	36.17	38.89	37.53	126.68	132.97	129.83	
Benthic Mat	551.33	538.65	544.99	372.45	554.63	463.54	282.47	284.20	283.34	
Wall Mat	205.06	171.90	188.48	39.13	47.01	43.07	168.85	162.90	165.87	
Total	962.46	878.89	920.68	447.75	640.52	544.14	578.01	580.07	579.04	
Periphyton TP (mg/m²)	002.10	0.0.00	525.55			4				
Floating Mat/Metaphyton	106.72	81.83	94.27	14.09	16.13	15.11	35.53	38.56	37.04	
Benthic Mat	367.38	435.27	401.33	238.94	326.25	282.59	217.73	258.71	238.22	
Wali Mat	56.34	44.86	50.60	15.76	20.35	18.06	38.16	36.11	37.13	
Total	530.44	561.96	546.20	268.79	362.72	315.76	291.42	333.38	312.40	
Periphyton TP (mg/kg)										
Floating Mat/Metaphyton	383.73	367.26	375.50	287.86	309.07	298.46	210.13	216.12	213.12	
Benthic Mat	526.98	650.21	588.60	502.21	491.13	496.67	550.07	628.49	589.28	
Wall Mat	199.38	189.89	194.64	293.07	316.82	304.95	156.63	155.64	156.13	
Average	421.71	497.98	457.78	464.64	464.62	464.63	360.43	405.55	383.17	
Periphyton TIP (mg/m²)										
Floating Mat/Metaphyton	43.34	45.73	44.53	6.05	6.43	6.24	9.46	11.59	10.52	
Benthic Mat	209.45	162.69	186.07	130.93	98.07	114.50	94.03	93.53	93.78	
Wall Mat	25.94	16.55	21.24	5.80	4.65	5.22	12.22	12.57	12.40	
Total	278.72	224.97	251.85	142.77	109.15	125.96	115.71	117.69	116.70	
Periphyton TIP (mg/kg)										
Floating Mat/Metaphyton	155.83	205.25	180.54	123.57	123.16	123.36	55.94	64.95	60.45	
Benthic Mat	300.43	243.03	271.73	275.18	147.64	211.41	237.55	227.22	232.39	
Wall Mat	91.79	70.05	80.92	107.86	72.32	90.09	50.18	54.18	52.18	
Average	221.59	199.36	211.08	246.80	139.81	185.35	143.11	143.17	143.14	
Periphyton Ca (g/m²)										
Floating Mat/Metaphyton	78.03	55.17	66.60	12.06	12.80	12.43	36.96	47.59	42.27	
Benthic Mat	161.76	105.96	133.86	57.02	104.74	80.88	86.84	82.14	84.49	
Wall Mat	69.27	138.44	103.86	16.77	15.28	16.03	65.13	71.58	68.35	
Total	309.05	299.57	304.31	85.85	132.82	109.33	188.93	201.31	195.12	
Periphyton Ca (mg/kg)	000570	047040	004007	040077	045070	045074	210502	266756	242674	
Floating Mat/Metaphyton	280576	247619	264097	246377	245370	245874	218592	266756	209477	
Benthic Mat	232026	158278	195152	119844	157672	138758	219400	199555	287919	
Wall Mat	245136	586057	415596	311881	237903	274892	267327	308511 244889	28/919	
Average	245706	265467	255051	148398	170134	160883	233672	244009	23832/	
Macrophyte TP (mg/m2)	154 50	120.00	140.00	75 74	150 12	117 40	157.64	138.64	148.14	
Aboveground	151.52	129.00	140.26	75.71	159.12 37.26	117.42	157.64 75.70	146.99	111.35	
Belowground Total	162.71	114.55	138.63	34.58	37.36 106.48	35.97 153.30	233.34	285.64	259.49	
Total	314.23	243.54	278.88	110.29	196.48	153.39	L 200.04	200.04	200.40	

Appendix A-2 Porta-PSTA Final Sampling Summary of Shellrock-Based Treatment (PP-4)

		3	·		Tank No. 5			10	
	Rep 1	Rep 2	Average	Rep 1	Rep 2	Average	Rep 1	Rep 2	Average
Soil Type	Shell	Shell	Shell	Shell	Shell	Shell	Shell	Shell	Shell
Tank Bottom Area (m²)	6	6	6	6	6	6	6	6	6
Water Depth (m)	0.37	0.37	0.37	0.38	0.38	0.38	0.36	0.36	0.36
Macrophyte TP (mg/kg)	700.0	057.0	200.4	500.0	700.0	0544	366.9	285.9	326.4
Aboveground	729.3 953.7	657.0 1008.5	693.1 981.1	520.6 1152.2	788.3 1140.8	654.4 1146.5	565.2	1041.1	803.1
Belowground	955.7 841.5	832.8	837.1	836.4	964.5	900.4	466.1	663.5	564.8
Average	041.3	032.0	037.1	630.4	304.3	300.4	400.1	000.0	00 (
Macrophyte (g wet/m²) Aboveground	1518.9		1518.9	862.4		862.4	2364.8		2364.8
Belowground	906.6		906.6	214.3		214.3	1090.2		1090.2
Total	2420.0		2420.0	1076.7		1076.7	3455.0		3455.0
Macrophyte (g DW/m²)									
Aboveground	207.8	196.3	202.1	145.4	201.9	173.7	429.6	484.9	457.3
Belowground	170.6	113.6	142.1	30.0	32.7	31.4	133.9	141.2	137.6
Total	378.4	309.9	344.1	175.4	234.6	205.0	563.6	626.1	594.8
Macrophyte (g AFDW/m²)									
Aboveground	175.1	165.7	170.4	124.5	178.7	151.6	381.1	420.9	401.0
Belowground	60.2	55.7	57.9	18.8	25.6	22.2	99.9	121.6	110.7
Total	235.4	221.4	228.4	143.3	204.3	173.8	481.0	542.5	511.7
Macrophyte (g ash/m²)									
Aboveground	32.6	30.6	31.6	20.9	23.2	22.1	48.6	64.0	56.3
Belowground	110.4	57.9	84.2	11.2	7.1	9.1	34.0	19.6	26.8
Total	143.0	88.6	115.8	32.1	30.3	31.2	82.6	83.6	83.1
Macrophyte Ca (g/m²)									
Aboveground `	5.48	3.48	4.48	3.42	1.42	2.42	5.11	8.05	6.58
Belowground	14.37	15.67	15.02	2.02	0.87	1.45	4.18	2.03	3.11
Total	19.85	19.15	19.50	5.44	2.30	3.87	9.29	10.08	9.69
Macrophyte Ca (mg/kg)								10000	4.4050
Aboveground	26400	17700	22050	23500	7040	15270	11900	16600	14250
Belowground	84200	138000	111100	67300	26700	47000	31200	14400	22800
Average	52462	61788	56661	30992	9784	18858	16487	16104	16285
Consumers									0.17
TP (mg/m²)	0.22		0.22	0.05		0.05	0.17	-	0.17
TP (mg/kg)	373.5	-	373.5	668.5		668.5	670.1		670.1
Ca (g/m²)	0.049		0.049	0.004		0.004	0.035		0.035 139169
Ca (mg/kg)	82826		82826	48965		48965	139169		
Wet Weight (g/m²)	15.17		15.17	5.17		5.17	16.83		16.83
Dry Weight (g/m²)	0.59		0.59	0.07	-	0.07	0.25		0.25
Ash Weight (g/m²)	0.39	-	0.39	0.05	-	0.05	0.12		0.12
AFDW (g/m²)	0.20		0.20	0.02	-	0.02	0.13	-	0.13
Soil TP (mg/m²)									
Upper (0-10 cm)	114911	158652	136781	131261	138510	134886	126204	153632	139918
Lower (10-20 cm)	135865	137994	136930	137471	136009	136740	115475	138225	126850
Total	250776	296646	273711	268732	274519	271626	241679	291856	266767
Soil TP (mg/kg)							070.4	1000 1	057.0
Upper (0-10 cm)	973.8	1057.7	1015.7	965.2	1065.5	1015.3	876.4	1038.1 973.4	957.2 944.9
Lower (10-20 cm)	970.5	965.0	967.7	875.6	850.1	862.8 939.1	916.5 896.4	9/3.4 1005.7	944.9 951.1
Average (0-20 cm)	972.1	1011.3	991.7	920.4	957.8	939.1	090.4	1005.7	331.1
Soil TIP (mg/m²)	115000		115000	125100		135186	134663		134663
Upper (0-10 cm)	115928	-	115928 135029	135186 132545		132545	114345	-	114345
Lower (10-20 cm) Total	135029 250957		250957	267732	-	267732	249008	_	249008
Soil TIP (mg/kg)	200937		250837	201132	_	20,702	2-7000		0000
Upper (0-10 cm)	982.4		982.4	994.0		994.0	935.2		935.2
Lower (10-20 cm)	964.5		964.5	844.2	-	844.2	907.5		907.5
Average (0-20 cm)	973.5		973.5	919.1	-	919.1	921.3		921.3
Soil Ca (g/m²)	0.0.0		3.0.0						
Upper (0-10 cm)	14868	24450	19659	23664	16900	20282	20448	18944	19696
Lower (10-20 cm)	20160	21879	21020	30301	26240	28271	20412	23714	22063
Total	35028	46329	40679	53965	43140	48553	40860	42658	41759
Soil Ca (mg/kg)									
Upper (0-10 cm)	126000	163000	144500	174000	130000	152000	142000	128000	135000
Lower (10-20 cm)	144000	153000	148500	193000	164000	178500	162000	167000	164500
Average (0-20 cm)	135000	158000	146500	183500	147000	165250	152000	147500	149750
Soil Percent Solids									
Upper (0-10 cm)	69.6	71.2	70.4	74.7	72.2	73.5	63.3	62.0	62.7
Lower (10-20 cm)	85.4	82.7	84.1	82.6	79.5	81.1	76.3	67.5	71.9
Average (0-20 cm)	77.5	77.0	77.2	78.7	75.9	77.3	69.8	64.8	67.3
Soil Dry Bulk Density (g/cm³)							· .		
Upper (0-10 cm)	1.180	1.500	1.340	1.360	1.300	1.330	1.440	1.480	1.460
Lower (10-20 cm)	1.400	1.430	1.415	1.570	1.600	1.585	1.260	1.420	1.340
Average (0-20 cm)	1.290	1.465	1.378	1.465	1.450	1.458	1.350	1.450	1.400

Note: -- = no data

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Appendix A-3
Porta-PSTA Final Sampling Summary of Sand-Based Treatments (PP-7 and PP-17)

Porta-PSTA Final Sampling Summary			Treatment a	nd Tank No.		
	-	PP-7			PP-17	
	-	19			20	
	Rep 1	Rep 2	Average	Rep 1	Rep 2	Average
Soil Type	Sand	Sand	Sand	Sand	Sand	Sand
Tank Bottom Area (m²)	6	6	6	6	6	6
Water Depth (m)	0.37	0.37	0.37	0.33	0.33	0.33
Inflow Phosphorus, Water (g/m						
TP	0.020		0.020	0.020		0.020
TDP	0.009		0.009	0.009		0.009
SRP	0.006		0.006	0.006		0.006
DOP	0.004		0.004	0.004		0.004
TPP	0.010		0.010	0.010		0.010
Outflow Phosphorus, Water (g/	•					
TP	0.011		0.011	0.021		0.021
TDP	0.007		0.007	0.014		0.014
SRP	0.001		0.001	0.003		0.003
DOP	0.006		0.006	0.011		0.011
TPP	0.004		0.004	0.007		0.007
Phosphorus, Water (mg/m²)	0.00					
TP	4.03		4.03	6.88		6.88
TDP	2.56		2.56	4.58		4.58
SRP	0.37		0.37	0.98		0.98
DOP	2.20		2.20	3.60		3.60
TPP	1.46		1.46	2.29		2.29
Periphyton (g DW/m²)	1.40		1.40	2.20		
Floating Mat/Metaphyton	174.84	302.84	238.84	232.50	227.35	229.92
Benthic Mat	1709.91	1918.68	1814.30	668.94	951.39	810.16
Wall Mat	87.50	145.21	116.35	4.25	2.32	3.28
Total	1972.25	2366.72	2169.49	905.69	1181.05	1043.37
Periphyton (g wet/m²)	1372.23	2000.72	2100.40	000.00	1101.00	
Floating Mat/Metaphyton	2835.00		2835.00	3250.00		3250.00
Benthic Mat	13155.00		13155.00	7485.00		7485.00
Wall Mat	1058.33		1058.33	378.33		378.33
Total	17048.33		17048.33	11113.33		11113.33
Periphyton (g AFDW/m ²)	17040.00		17040.00	11110.00		11110.00
Floating Mat/Metaphyton	46.91	70.60	58.75	55.33	53.82	54.58
Benthic Mat	46.91 164.64	170.43	167.54	108.20	134.21	121.20
Wall Mat	23.35	22.88	23.11	1.54	0.81	1.18
	23.35 234.90	263.91	23.11 249.40	165.08	188.84	176.96
Total	234.90	203.91	249.40	100.00	100.04	170.30
Periphyton (g ash/m²)	100.00	000.04	100 10	177 17	170 50	175.35
Floating Mat/Metaphyton	128.00	232.24	180.12	177.17	173.53 816.57	688.44
Benthic Mat	1545.27	1745.82	1645.55	560.31 2.70	35.37	19.03
Wall Mat	64.15	122.33	93.24	740.18	1025.46	882.82
Total	1737.42	2100.39	1918.91	740.16	1025.46	002.02
Periphyton TP (mg/m²)	40.00	00.50	50.40	05.40	64.64	CE 00
Floating Mat/Metaphyton	40.29	66.52	53.40	65.43	64.61	65.02
Benthic Mat	553.69	555.79	554.74	114.55	190.01	152.28
Wall Mat	13.78	22.86	18.32	3.06	1.47	2.27
Total	607.76	645.17	626.46	183.04	256.09	219.57
Periphyton TP (mg/kg)	000 45	010.05	OOF OF	201 40	284.20	282.80
Floating Mat/Metaphyton	230.45	219.65	225.05	281.40		282.80 185.48
Benthic Mat Wall Mat	323.81 157.44	289.67 157.44	306.74 157.44	171.24 720.84	199.72 635.58	678.21
	157.44	157.44	157.44			
Average	308.15	272.60	288.76	202.10	216.84	210.4

Appendix A-3
Porta-PSTA Final Sampling Summary of Sand-Based Treatments (PP-7 and PP-17)

Porta-PSTA Final Sampling Summary	or cana bases 1	reaments (1 1	Treatment a	nd Tank No.	· · · · · · · · · · · · · · · · · · ·	
		PP-7			PP-17	
		19			20	
	Rep 1	Rep 2	Average	Rep 1	Rep 2	Average
Soil Type	Sand	Sand	Sand	Sand	Sand	Sand
Tank Bottom Area (m²)	6	6	6	6	6	6
Water Depth (m)	0.37	0.37	0.37	0.33	0.33	0.33
Periphyton TIP (mg/m²)						
Floating Mat/Metaphyton	6.03	8.74	7.38	11.30	9.46	10.38
Benthic Mat	30.57	41.75	36.16	30.04	34.80	32.42
Wall Mat	1.92	2.74	2.33	0.10	0.34	0.22
Total	38.52	53.22	45.87	41.44	44.59	43.01
Periphyton TIP (mg/kg)						
Floating Mat/Metaphyton	34.49	28.85	31.67	48.59	41.59	45.09
Benthic Mat	17.88	21.76	19.82	44.91	36.58	40.74
Wall Mat	21.95	18.8 5	20.40	23.15	144.88	84.01
Average	19.53	22.49	21.14	45.75	37.75	41.23
Periphyton Ca (g/m²)						
Floating Mat/Metaphyton	49.81	39.65	44.73	45.92	41.29	43.61
Benthic Mat	141.81	193.60	167.70	64.75	80.28	72.51
Wall Mat	25.00	21.64	23.32	0.85	0.44	0.64
Total	216.62	254.89	235.76	111.52	122.01	116.76
Periphyton Ca (mg/kg)						
Floating Mat/Metaphyton	284906	130937	207921	197495	1 816 33	189564
Benthic Mat	82932	100901	91916	96795	84380	90587
Wall Mat	285714	149057	217385	200000	190090	195045
Average	109833	107699	108669	123130	103308	111911
Macrophyte TP (mg/m²)						
Aboveground	92.99	82.82	87.91	107.45	69 .33	88.39
Belowground	123.48	90.20	106.84	107.37	76.53	91.95
Total	216.47	173.02	194.75	214.81	145.86	180.34
Macrophyte TP (mg/kg)						
Aboveground	556.7	462.4	509.6	744.8	428 .3	586.5
Belowground	1499.1	1168.0	1333.6	1470.4	1084.6	1277.5
Average	1027.9	815.2	921.6	1107.6	756 .5	932.0
Macrophyte (g wet/m²)						
Aboveground	829.6		829.6	626.6		626.6
Belowground	663.7		663.7	476.8		476.8
Total	1493.3		1493.3	1103.3		1103.3
Macrophyte (g DW/m²)						
Aboveground	167.0	179.1	173.1	144.3	161.9	153.1
Belowground	82.4	77.2	79.8	73.0	70.6	71.8
Total	249.4	256.3	252.9	217.3	232.4	224.9
Macrophyte (g AFDW/m²)						
Aboveground	147.5	157.8	152.6	104.9	142.9	123.9
Belowground	71.7	68.4	70.0	62.4	55.9	59.2
Total	219.2	226.2	222.7	167.3	198.8	183.1
Macrophyte (g ash/m²)						
Aboveground	19.5	21.3	20.4	39.4	18.9	29.2
Belowground	10.7	8.8	9.8	10.6	14.7	12.6
Total	30.3	30.1	30.2	50.0	33.6	41.8
Macrophyte Ca (g/m²)						
Aboveground	0.75	1.13	0.94	2.16	1.14	1.65
Belowground	0.45	0.44	0.45	0.60	0.49	0.54
Total	1.20	1.58	1.39	2.76	1.63	2.20

Appendix A-3
Porta-PSTA Final Sampling Summary of Sand-Based Treatments (PP-7 and PP-17)

Porta-PSTA Final Sampling Summary	of Sand-Based Ti	eatments (PP-7				
			Treatment a	nd Tank No.		
		PP-7			PP-17	
		19	A	D 4	20	A
Sail Time	Rep 1 Sand	Rep 2 Sand	Average Sand	Rep 1 Sand	Rep 2	Average Sand
Soil Type	6 6	6	5anu 6	6 Sanu	Sand 6	6
Tank Bottom Area (m²)	0.37	0.37	0.37	0.33	0.33	0.33
Water Depth (m) Macrophyte Ca (mg/kg)	0.37	0.37	0.37	0.33	0.33	0.33
Aboveground	4520	6330	5425	15000	7050	11025
Belowground	5440	5760	5600	8220	6900	7560
Average	4824	6158	5500	12722	7004	9767
Consumers	102 1	0.00	0000			
TP (mg/m²)	2.47		2.47	0.01		0.01
TP (mg/kg)	4066.7		4066.7	160.6		160.6
Ca (g/m²)	0.089		0.089	0.008		0.008
	146336		146336	175425		175425
Ca (mg/kg)						
Wet Weight (g/m²)	15.50		15.50	6.50		6.50
Dry Weight (g/m²)	0.61		0.61	0.04		0.04
Ash Weight (g/m²)	0.34		0.34	0.02		0.02
AFDW (g/m²)	0.27		0.27	0.02		0.02
Soil TP (mg/m²)						
Upper (0-10 cm)	3239	3113	3176	2705	2222	2463
Lower (10-20 cm)	2470	2429	2450	3019	340 5	3212
Total	5708	5542	5625	5724	5627	567 5
Soil TP (mg/kg)						
Upper (0-10 cm)	24.5	23.2	23.9	19.5	17.4	18.4
Lower (10-20 cm)	16.7	15.9	16.3	19.0	21.7	20.3
Average (0-20 cm)	20.6	19.6	20.1	19.2	19.5	19.4
Soil TIP (mg/m²)						
Upper (0-10 cm)	1384		1384	1361		1361
Lower (10-20 cm)	1356		1356	1086		1086
Total	2740		2740	2447		2447
Soil TIP (mg/kg)						
Upper (0-10 cm)	10.5		10.5	9.8		9.8
Lower (10-20 cm)	9.2		9.2	6.8		6.8
Average (0-20 cm)	9.8		9.8	8 .3		8.3
Soil Ca (g/m2)						
Upper (0-10 cm)	764.28	723.6	744	79.091	86.784	83
Lower (10-20 cm)	93.24	86.139	90	80.772	185.26	133
Total	858	810	834	160	272	216
Soil Ca (mg/kg)	5700	E 400	5505	500	070	604
Upper (0-10 cm)	5790	5400	5595	569	678	624
Lower (10-20 cm)	630	563	597	508	1180	844
Average (0-20 cm)	3210	2982	3096	539	929	734
Soil Percent Solids	70.0	70.0	70.5	92.4	92.0	92.2
Upper (0-10 cm)	73.9	73.0	73.5	83.4	83.0	83.2 80.2
Lower (10-20 cm)	81.0 77.5	80.8 76.0	80.9	79.5	80.9	80.2 81.7
Average (0-20 cm)	77.5	76.9	77.2	81.5	82.0	01.7
Soil Dry Bulk Density (g/cm³)	4 000	4.040	4.000	1 000	4 000	1 005
Upper (0-10 cm)	1.320	1.340	1.330	1.390	1.280	1.335
Lower (10-20 cm)	1.480	1.530	1.505	1.590	1.570 1.425	1.580 1.458
Average (0-20 cm) Note:	1.400	1.435	1.418	1.490	1.420	1.400

Note:

-- = no data

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Appendix A-4
Porta PSTA Final Sampling Summary of No Substrate Treatment (PP-18)

_		Tank No. 21	
_	Rep 1	Rep 2	Average
Soil Type	None	None	None
Tank Bottom Area (m²)	6	6	6
Water Depth (m)	0.31	0.31	0.31
Inflow Phosphorus, Water (g/m ³)			
TP	0.020	,	0.020
TDP	0.009		0.009
SRP	0.006		0.006
DOP	0.004		0.004
TPP	0.010		0.010
Outflow Phosphorus, Water (g/m³)			
TP	0.011		0.011
TDP	0.009		0.009
SRP	0.003		0.003
DOP	0.006		0.006
TPP	0.002		0.002
Phosphorus, Water (mg/m²)			
TP	3.44		3.44
TDP	2.82		2.82
SRP	0.94		0.94
DOP	1.88		1.88
TPP	0.63		0.63
Periphyton (g DW/m²)			
Floating Mat/Metaphyton	359.93	412.14	386.04
Benthic Mat	684.55	559.54	622.04
Wall Mat	135.20	139.60	137.40
Total	1179.68	1111.28	1145.48
Periphyton (g wet/m²)			
Floating Mat/Metaphyton	5443.33		5443.33
Benthic Mat	10205.00		10205.00
Wall Mat	2248.33		2248.33
Total	17896.67		17896.67
Periphyton (g AFDW/m²)			
Floating Mat/Metaphyton	94.33	104.41	99.37
Benthic Mat	181.88	139.55	160.72
Wall Mat	35.17	36.05	35.61
Total	311.39	280.02	295.70
Periphyton (g ash/m²)			
Floating Mat/Metaphyton	265.60	307.73	286.66
Benthic Mat	502.66	419.99	461.33
Wall Mat	100.03	103.69	101.86
Total	868.29	831.41	849.85
Periphyton TP (mg/m²)			
Floating Mat/Metaphyton	63.22	70.34	66.78
Benthic Mat	184.82	166.28	175.55
Wall Mat	20.98	20.98	20.98
Total	269.02	257.60	263.31

Appendix A-4
Porta PSTA Final Sampling Summary of No Substrate Treatment (PP-18)

Porta PSTA Final Sampling Summary of		Tank No. 21	
	Rep 1	Rep 2	Average
Soil Type	None	None	None
Tank Bottom Area (m²)	6	6	6
Water Depth (m)	0.31	0.31	0.31
Periphyton TP (mg/kg)			
Floating Mat/Metaphyton	175.64	170.67	173.15
Benthic Mat	269.99	297.17	283.58
Wall Mat	155.17	150.30	152.73
Average	228.04	231.80	229.87
Periphyton TIP (mg/m²)			
Floating Mat/Metaphyton	16.17	18.17	17.17
Benthic Mat	33.31	23.80	28.55
Wall Mat	2.77	3.19	2.98
Total	52.25	45.16	48.71
Periphyton TIP (mg/kg)			
Floating Mat/Metaphyton	44.93	44.10	44.51
Benthic Mat	48.66	42.53	45.60
Wall Mat	20.48	22.84	21.66
Average	44.29	40.64	42.52
Periphyton Ca (g/m²)			
Floating Mat/Metaphyton	82.34	97.08	89.71
Benthic Mat	150.14	141.21	145.67
Wall Mat	32.10	34.22	33.16
Total	264.57	272.51	268.54
Periphyton Ca (mg/kg)			
Floating Mat/Metaphyton	228753	235556	232154
Benthic Mat	219324	252364	235844
Wall Mat	237398	245144	241271
Average	224272	245223	234435
Consumers			
TP (mg/m²)	5.69		5.69
TP (mg/kg)	1466.3		1466.3
Ca (g/m²)	0.767		0.767
Ca (mg/kg)	197518		197518
Wet Weight (g/m²)	24.83		24.83
Dry Weight (g/m²)	3.88		3.88
Ash Weight (g/m²)	2.55		2.55
AFDW Weight (g/m²)	1.33		1.33
7.1. 544 440 igitt (g/iii /	1.00		

Note:

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^{-- =} no data

Appendix A-5Porta-PSTA Final Sampling Summary of Aquamat Treatment (PP-19)

Porta-PSTA Final Sampling Summary		Tank No. 22	
	Rep 1	Rep 2	Average
Soil Type	AquaMat	AquaMat	AquaMat
Tank Bottom Area (m²)	6	6	6
Water Depth (m)	0.33	0.33	0.33
Inflow Phosphorus, Water (g/m ³	³)		
TP	0.020		0.020
TDP	0.009	, 	0.009
SRP	0.006		0.006
DOP	0.004		0.004
TPP	0.010		0.010
Outflow Phosphorus, Water (g/r	ກ ³)		
TP	0.011		0.011
TDP	0.007		0.007
SRP	0.001		0.001
DOP	0.006		0.006
TPP	0.004		0.004
Phosphorus, Water (mg/m²)			
TP	3.59		3.59
TDP	2.29		2.29
SRP	0.33		0.33
DOP	1.96		1.96
TPP	1.31		1.31
Periphyton (g DW/m²)			
Floating Mat/Metaphyton	487.42	477.52	482.47
Benthic Mat	540.83	528.37	534.60
Wall Mat	185.13	220.83	202.98
Total	1213.38	1226.72	1220.05
Periphyton (g wet/m²)			
Floating Mat/Metaphyton	7408.33		7408.33
Benthic Mat	8996.67		8996.67
Wall Mat	4083.33		4083.33
Total	20488.33		20488.33
Periphyton (g AFDW/m²)	20 .00.00		
Floating Mat/Metaphyton	127.42	126.18	126.80
Benthic Mat	130.14	128.58	129.36
Wall Mat	48.47	56.63	52.55
Total	306.03	311.40	308.72
Periphyton (g ash/m²)		= · · · · •	
Floating Mat/Metaphyton	360.00	351.34	355.67
Benthic Mat	367.83	399.00	383.42
Wall Mat	136.88	163.84	150.36
Total	864.71	914.18	889.44
Periphyton TP (mg/m²)	JJ	J	
Floating Mat/Metaphyton	86.01	86.19	86.10
Benthic Mat	153.27	149.63	151.45
Wall Mat	31.98	38.19	35.08
Total	271.27	274.00	272.63

DFB/16615.xls

Appendix A-5
Porta-PSTA Final Sampling Summary of Aquamat Treatment (PP-19)

Pona-PSTA Final Sampling Summary		Tank No. 22	
	Rep 1	Rep 2	Average
Soil Type	AquaMat	AquaMat	AquaMat
Tank Bottom Area (m²)	6	6	6
Water Depth (m)	0.33	0.33	0.33
Periphyton TP (mg/kg)			
Floating Mat/Metaphyton	176.47	180.49	178.48
Benthic Mat	283.40	283.19	283.30
Wall Mat	172.74	172.91	172.83
Average	223.56	223.36	223.46
Periphyton TIP (mg/m²)			
Floating Mat/Metaphyton	28.73	33.39	31.06
Benthic Mat	47.86	49.55	48.70
Wall Mat	9.58	7.15	8.36
Total	86.17	90.09	88.13
Periphyton TIP (mg/kg)			
Floating Mat/Metaphyton	58.95	69.93	64.44
Benthic Mat	88.49	93.78	91.13
Wall Mat	51.73	32.36	42.05
Average	71.02	73.44	72.23
Periphyton Ca (g/m²)			
Floating Mat/Metaphyton	107.63	108.99	108.31
Benthic Mat	145.57	127.34	136.46
Wall Mat	46.67	54.57	50.62
Total	299.88	290.89	295.38
Periphyton Ca (mg/kg)			
Floating Mat/Metaphyton	220812	228238	224525
Benthic Mat	269164	241003	255084
Wall Mat	252121	247097	249609
Average	247141	237131	242109
Consumers			
TP (mg/m²)	9.07		9.07
TP (mg/kg)	2714.5		2714.5
Ca (g/m²)	1.031		1.031
Ca (mg/kg)	308686		308686
Wet Weight (g/m²)	26.50		26.50
Dry Weight (g/m²)	3.34		3.34
Ash Weight (g/m²)	1.33		1.33
AFDW (g/m²)	2.01		2.01
Note:	2.01		

Note:

DFB/16615.xls A-11

^{-- =} no data

Field Data Sheets and Chain of Custody

FEBRUARY 12, 2001 DESTRUCTIVE SAMPLING EVENT - BP

P247

Chain of Custody Form CH2M HILL

Satch Generated on: 02/02/2001 1:53:11 PM (6/05) (6/07)

Date / Time: Date / Time: Date / Time: Comments 80 21830 Project: HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR KIT Request ID: Lab: Relinquished By: Relinquished By: Relinquished By Ellen Patterson / USA 954.426.6112 x233 **Analysis Requested** Custody Seal: Y / N Custody Seal: Y / N Custody Seal: Y / N AFDW, Ca++, DWght Number of Containers Date / Time: 2/16/6/ 1300 Cooler Temp: Cpoler Temp: 32/ Laboratory Coordinator: Matrix dd d dd dd ద Ы ЬÞ 4 ဓ 9 4 윱 ద ద <u>d</u> Date / Time: $2/(\omega/c)$ Date / Time:2/16/0/ essa) 1076 FedEx Hand Other (please specify): 1525 c 803 475/ 055/ 1530 0953 2460 <u> ४</u> 0800 6 1635 7215 Poll 9 1350 1130 54450 1125 02/30/ 02/20 021501 62120 105120 100-100 102150 021301 02120 021401 02120 105120 02120 103120 CL1301 3270 105120 156170 04/40 CANADO 021401 07 140 148010.01.05.CH PP-EB2-BP PP-22-BP PP-EB1-BP PP-FD2-BP PP-FD1-BP PP-17-8P PP-19-BP PP-21-BP PP-21-BP PP-22-8P PP-14-BP PP-14-BP PP-17-8P PP-19-BP PP-20-BP Station ID PP-10-BP PP-10-BP PP-20-BP PP-3-BP PP-5-BP PP-3-BP PP-5-BP UPS PP-EB1-BP PP-20-BP2 PP-22-BP2 PP-F01-BP PP-FD2-BP PP-EB2-8P PP-21-BP2 PP-22-BP1 COC Number: PP-14-BP2 PP-17-BP2 PP-19-BP2 PP-21-BP1 Project #: PP-14-BP1 PP-10-BP1 PP-17-8P1 PP-19-BP1 PP-20-BP1 Received By: Sample ID PP-5-BP2 Received By: PP-3-BP1 PP-3-BP2 PP-10-BP2 Sampled By: Shipped Via: PP-5-BP1 Remarks:

rptChainOfCustody - updated 981112

Page 1 of 2

FEBRUARY 12, 2001 DESTRUCTIVE SAMPLING EVENT - FP

CH2M HILL Chain of Custody Form PSTA

BARG HORA 16 Generated on: 02/02/2001 1:31:09 PM H (6/03) 16/04 16/04

Station ID		P247 Pro	oject: HYTO	-BASED STORMWA1	TER TRE?	ATMENT AREA	ESEARC	EMONSTRATION PR	equest ID:
PP-3-FP C-21-No. 1.55.6 PP 1 AFDW, Ca++, DWght PP-3-FP C-31-No. C-		148010.01.05	5.СН	Laboratory Coord	Inator:	Ellen P	Patterson / USA 954.426	.6112 x233	Lab:
PP-3-FP 0.2-\(\text{Colored}\) 135\(\text{C}\) PP 1 AFDW, Ga++, DWght PP-5-FP 0.2-\(\text{C}\) 135\(\text{C}\) PP 1 AFDW, Ga++, DWght PP-5-FP 0.2-\(\text{C}\) 135\(\text{C}\) PP 1 AFDW, Ga++, DWght PP-6-FP 0.2-\(\text{C}\) 135\(\text{C}\) PP 1 AFDW, Ga++, DWght PP-6-FP 0.2-\(\text{C}\) 0.2-\(\text{C}\) PP 1 AFDW, Ga++, DWght PP-6-FP 0.2-\(\text{C}\) 0.2-\(\text{C}\) PP 1 AFDW, Ga++, DWght PP-6-FP 0.2-\(\text{C}\) 0.2-\(\text{C}\) 0.2-\(\text{C}\) PP 1 AFDW, Ga++, DWght PP-6-FP 0.2-\(\text{C}\)	OI :	Station ID	Date Co		Matrix	Number of Containers	Analysis Re	dnested	Comments
PP-3-FP 02-1061 13-50 PP 1 AFDW, Ca++, DWght PP-3-FP 02-102-1 13-50 PP 1 AFDW, Ca++, DWght PP-3-FP 02-102-1 10-10 10-10 PP 1 AFDW, Ca++, DWght PP-3-FP 02-102-1 10-10 10-10 PP 1 AFDW, Ca++, DWght PP-3-FP 02-102-1 10-10 10-10 PP 1 AFDW, Ca++, DWght PP-3-FP 02-102-1 10-10 10-1	P.	PP-3-FP	105/20	1356	ЬР	1	AFDW, Ca++, DWght		307.603
PP-6-FP O1\12-0.	:P2	PP-3-FP	106120	1350	ЬР	-	AFDW, Ca++, DWght		10S
PP-6-FP \$-11,2-1 S-13 PP 1 AFDW, Ca++, DWght	£	PP-5-FP	021301	1540	d d	-	AFDW, Ca++, DWght		302
PP-10-FP O21-to 12.0 PP 1 AFDW, Ca++ DWght	FP2	PP-5-FP	105/50	1543	ЬР	1	AFDW, Ca++, DWght		3Q 5
2 PP-10-FP ONLY ONLY DP 1 AFDW, Ca++, DWght 1 PP-14-FP ONLY ONLY DP 1 AFDW, Ca++, DWght 2 PP-14-FP ONLY ONLY DP 1 AFDW, Ca++, DWght 1 PP-13-FP ONLY ONLY DP 1 AFDW, Ca++, DWght 2 PP-13-FP ONLY ONLY DP 1 AFDW, Ca++, DWght 2 PP-13-FP ONLY ONLY DP 1 AFDW, Ca++, DWght 3 PP-13-FP ONLY ONLY DP 1 AFDW, Ca++, DWght 4 PP-23-FP ONLY DP 1 AFDW, Ca++, DWght 5 PP-23-FP ONLY DP 1 AFDW, Ca++, DWght 5 PP-23-FP ONLY DP 1 AFDW, Ca++, DWght 6 PP-23-FP ONLY DP 1 AFDW, Ca++, DWght 7 PP-23-FP ONLY DP 1 AFDW, Ca++, DWght 8 PP-23-FP ONLY DP 1 AFDW, Ca++, DWght 9 PP-23-FP ONLY DP 1 AFDW, Ca++, DWght 10 PP-23-FP ONLY DP 1 AFDW, Ca++, DWght 11 PP-23-FP ONLY DP 1 AFDW, Ca++, DWght 12 PP-23-FP ONLY DP 1 AFDW, Ca++, DWght 13 PP-24-FP ONLY DP 1 AFDW, Ca++, DWght 14 PP-25-FP ONLY DP 1 AFDW, Ca++, DWght 15 PP-25-FP ONLY DP 1 AFDW, Ca++, DWght 16 PP-25-FP ONLY DP 1 AFDW, Ca++, DWght 17 PP-25-FP ONLY DP 1 AFDW, Ca++, DWght 18 PP-25-FP ONLY DP 1 AFDW, Ca++, DWght 19 PP-25-FP ONLY DP 1 AFDW, Ca++, DWght 19 PP-25-FP ONLY DP 1 AFDW, Ca++, DWght 10 PP-25-FP ONLY	-FP1	PP-10-FP	(0)(00	0/0/	ЬР	1	AFDW, Ca++, DWght		60
PP-14-FP O2/CO C415 PP 1 AFDW, Ca++, DWght AFDW, Ca+	-FP2	PP-10-FP	107100	7101	ЬР	1	AFDW, Ca++, DWght		80x
PP-14-FP CONSON CALS PP 1 AFDW, Ca++, DWght PP-14-FP CONSON CALS PP 1 AFDW, Ca++, DWght PP-17-FP CONSON CALS PP 1 AFDW, Ca++, DWght PP-17-FP CONSON CALS PP 1 AFDW, Ca++, DWght PP-17-FP CONSON CALS PP 1 AFDW, Ca++, DWght PP-20-FP CONSON CALS PP-20-FP CON			1	1	Į				
PP-14-FP CONCON		d distant	1	•	4				क्ष
2 PP-14-FP O2.1CD	PP-14-FP1	PP-14-FP	92150	0425	ЬР	1	AFDW, Ca++, DWght		50S #5 6
PP-17-FP O2\(1950\) O2\(1	PP-14-FP2	PP-14-FP	103150	0930	ЬР	1	AFDW, Ca++, DWght		013 120 110
2 PP-17-FP O2ASCA INS	PP-17-FP1	PP-17-FP	02,501	0011	ЬР	1	AFDW, Ca++, DWght		
1 PP-18-FP 021361 0930 PP 1 AFDW, Ca++, DWght AFD	PP-17-FP2	PP-17-FP	22150	SCN	ЬР	1	AFDW, Ca++, DWght		C 37 5/12
2 PP-19-FP 02/30 / 04334 PP 1 AFDW, Ca++, DWght 1 PP-20-FP 02/120 / 1650 PP 1 AFDW, Ca++, DWght 2 PP-21-FP 02/120 / 150	PP-19-FP1	PP-19-FP	105120	0930	ЬР	1	AFDW, Ca++, DWght		1 60250 V
PP-20-FP O21201 1656 PP 1 AFDW, Ca++, DWght	PP-19-FP2	PP-19-FP	105120	45 80	ЬР	1	AFDW, Ca++, DWght		767
2 PP-20-FP O21201 CS (S) PP 1 AFDW, Ca++, DWght 2 PP-21-FP 621201 CS (S) PP 1 AFDW, Ca++, DWght 1 PP-21-FP 021201 CS (S) PP 1 AFDW, Ca++, DWght 1 PP-22-FP 021201 CS (S) PP 1 AFDW, Ca++, DWght 1 PP-ED1-FP 021201 CS (S) PP 1 AFDW, Ca++, DWght 1 PP-EB1-FP 021201 CS (S) PP 1 AFDW, Ca++, DWght Custody Seal: Y / N 1 PP-EB1-FP CS (C) (C) CS (C) CS (C) CS (C) CS (C) CS (C) 1 PP-EB2-FP CS (C) (C) CS (C) CS (C) CS (C) CS (C) CS (C) CS (C) 1 CS (C) (C) CS (C) <td>-FP1</td> <td>PP-20-FP</td> <td>102120</td> <td>1650</td> <td>ЬР</td> <td>1</td> <td>AFDW, Ca++, DWght</td> <td></td> <td>8</td>	-FP1	PP-20-FP	102120	1650	ЬР	1	AFDW, Ca++, DWght		8
1 PP-21-FP 62/261 /S1S PP 1 AFDW, Ca++, DWght 2 PP-21-FP 62/1261 /S1S PP 1 AFDW, Ca++, DWght 2 PP-22-FP 62/1261 /SSS PP 1 AFDW, Ca++, DWght 2 PP-22-FP 62/1261 /SSS PP 1 AFDW, Ca++, DWght 3 PP-EB1-FP 62/1261 CG3S PP 1 AFDW, Ca++, DWght 3 PP-EB1-FP CG1/261 CG3S PP 1 AFDW, Ca++, DWght 3 PP-EB1-FP CG1/261 CG2S WQ 1 AFDW, Ca++, DWght 4 PP-EB1-FP CG1/261	-FP2	PP-20-FP	192720	1655	ЬР	1	AFDW, Ca++, DWght		495
2 PP-21-FP O2 120 I ISSS PP 1 AFDW, Ca++, DWght Ca++, DWght <th< td=""><td>-FP1</td><td>PP-21-FP</td><td>102120</td><td>0\\$\</td><td>ЬР</td><td>1</td><td>AFDW, Ca++, DWght</td><td></td><td>258</td></th<>	-FP1	PP-21-FP	102120	0\\$\	ЬР	1	AFDW, Ca++, DWght		258
PP-22-FP O21/20 ISOO PP 1 AFDW, Ca++, DWght	-FP2	PP-21-FP	102120	1515	ЬР	1	AFDW, Ca++, DWght		695 SPO
2 PP-22-FP 621261 1500 C439 PP 1 AFDW, Ca++, DWght PP-FD1-FP 02(35) PP 1 AFDW, Ca++, DWght PP-FD1-FP 02(35) NQ 1 AFDW, Ca++, DWght PP-FB2-FP 02(35) NQ 1 AFDW, Ca++, DWght PP-EB2-FP 02(35) NQ 1 AFDW, Ca++,	2-FP1	PP-22-FP	102120	(45)	ЬР	1	AFDW, Ca++, DWght		
PP-FD1-FP O2 (1)20 (1) C9(3) PP 1 AFDW, Ca++, DWght	-FP2	PP-22-FP	021201	1500	qq	-	AFDW, Ca++, DWght		12/1/2/88 1 5 (F)
PP-FB2-FP C2135 PP 1 AFDW, Ca++, DWght PP-EB1-FP C2135 NQ 1 AFDW, Ca++, DWght Ca++, DWght PP-EB2-FP C2135 NQ 1 AFDW, Ca++, DWght Ca++, DWght PP-EB2-FP C2135 NQ 1 AFDW, Ca++, DWght Cathody Seal: Y / N PP-EB2-FP C214 Cathody Seal: Y / N Relinquished By: PP-EB2-FP C214 Cathody Seal: Y / N Relinquished By: C214 Cathody Seal: Y / N Relinquished By:	11-FP	PP-FD1-FP	105120	0439	ЬР	1	AFDW, Ca++, DWght		265
PP-EB1-FP O2 1/10 1 VOL WQ 1 AFDW, Ca++, DWght X	32-FP	PP-FD2-FP	105120	56 05	ЬР	4	AFDW, Ca++, DWght		2568
FP-EB2-FP 02\mathrm{O}\tag{\text{O}}\tag{\text{O}}\tag{\text{O}}\tag{\text{O}}\tag{\text{O}}\tag{\text{O}}\tag{\text{O}}\tag{\text{C}}\tag{\text{O}}\tag{\text{O}}\tag{\text{O}}\tag{\text{O}}\tag{\text{C}}\tag{\text{C}}\te	81-FP	PP-E81-FP	101.100	107	WQ	1	AFDW, Ca++, DWght		N 44 23
UPS FedEx Hand Other (please specify): Soler Temp: Date / Time: 2/(4/5) (2.5.) Custody Seal: Y / N Relinquished By:	82-FP	PP-EB2-FP	104/60	7701	WQ	1	AFDW, Ca++, DWght		TANKE SIN
UPS FedEx Hand Other (please specify): Soler Temp: Custody Seal: Y / N Relinquished By:	7	10							
UPS FedEx Hand Other (please specify): Sunch Land Other (please specify): Custody Seal: Y / N Relinquished By: Cooler Temp: Custody Seal: Y / N Relinquished By:	Sampled By: $/\!\!/_{\!$, (M	Date	2/14	,	કે.	- 1	Relinquished By:	Date / Time:
: らのしてみん Date / Time: 如 Cooler Temp: Custody Seal: Y / N Relinquished By: Cooler Temp: Custody Seal: Y / N Relinquished By:	Shipped Via: UP	FedEx		lease specify):					
/ Date / Time: Cooler Temp: Custody Seal: Y / N Relinquished By:	1 By: 5 00.	Ch. le	Date	•		r Temp:	Custody Seal: Y / N	Relinquished By:	Date / Time:
	By:		Date	1 1		r Temp:	Custody Seal: Y / N	Relinquished By:	Date / Time:

FEBRUARY 12, 2001 DESTRUCTIVE SAMPLING EVENT - WP

CH2M HILL

Chain of Custody Form

PSTA

Project: HYTON-BASED STORWMATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR KIT REQUEST ID: Lab: Ellen Patterson / USA 954.426.6112 x233 Laboratory Coordinator: 148010.01.05.CH P247 COC Number: Project #:

9	2	Date & Time			Number of			
Sample ID	Station ID	Collected		Watrix	Containers	Analysis Requested	ednesied	Comments
PP-3-WP1	PP-3-WP	105120	1325	ЬР	1	AFDW, Ca++, DWght		202516
PP-3-WP2	PP-3-WP	105120	1330	ф	1	AFDW, Ca++, DWght		9,0
PP-5-WP1	PP-5-WP	07.33	1,555	ЬР	-	AFDW, Ca++, DWght		£/S
PP-5-WP2	PP-5-WP	02140	1558	ЬР	-	AFDW, Ca++, DWght		2/2
PP-10-WP1	PP-10-WP	104170	0011	ЬÞ	1	AFDW, Ca++, DWght		Sla
PP-10-WP2	PP-10-WP	(०५/५०)	5011	ЬР	-	AFDW, Ca++, DWght		220
PP-12-WP1	PP-12-WP	021481	1330	ЬР	-	AFDW, Ca++, DWght		172
PP-12-WP2	PP-12-WP	OZHO	(330	dd	-	AFDW, Ca++, DWght		722
PP-14-WP1	PP-14-WP	321861	3460	d d	-	AFDW, Ca++, DWght		\$28
PP-14-WP2	PP-14-WP	32150	OASO	ЬР	1	AFDW, Ca++, DWght		Ť
PP-17-WP1	PP-17-WP	105150	5021	ЬР	1	AFDW, Ca++, DWght		525
PP-17-WP2	PP-17-WP	105120	Sarı	ЬР	-	AFDW, Ca++, DWght		<i>57</i> CS
PP-19-WP1	PP-19-WP	196120	1655	ЬР	1	AFDW, Ca++, DWght		523
PP-19-WP2	PP-19-WP	021301	1100	dd	1	AFDW, Ca++, DWght		328
PP-20-WP1	PP-20-WP	021301	1000	ЬР	1	AFDW, Ca++, DWght	014m/8	Ptseco somes
PP-20-WP2	PP-20-WP	105120	1005	dd	1	AFDW, Ca++, DWght	<u> </u>	SS
PP-21-WP1	PP-21-WP	102120	1545	ЬР	1	AFDW, Ca++, DWght	(,) ,	575 - 1990 2/16/01AFL
PP-21-WP2	PP-21-WP	192120	1550	РР	1	AFDW, Ca++, DWght	2160 CH	Jacobe CH
PP-22-WP1	PP-22-WP	102120	1600	РР	1	AFDW, Ca++, DWght	1 100	577
PP-22-WP2	PP-22-WP	102120	1605	РР	-	AFDW, Ca++, DWght		578
PP-FD1-WP	PP-FD1-WP	021301	F001	РР	1	AFDW, Ca++, DWght)	2/16/01 5/54 (720)
PP-FD2-WP	PP-FD2-WP	102120	1555	dd	-	AFDW, Ca++, DWght	5	contra 579
PP-EB1-WP	PP-EB1-WP	Ť	८ ३३ ३	WQ	1	AFDW, Ca++, DWght		26.1 582 53
PP-EB2-WP	PP-EB2-WP	1	4761	WQ	1	AFDW, Ca++, DWght		290333
,	11 . 11	í						
Sampled By:	JJ 77	Date / Time:	Fime: $2/l_6/\omega_0$		200	Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: / U	UPS FedEx Ha	Hand Other (ple	Other (please specify):					
Received By: $\mathcal{C}\mathcal{Q}$	" (Smoth	Date / 1	Date / Time3/16/0 / (7	Cooler /	r Temp:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Received By:		Date / Time:		Cooler	ır Temp:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Remarks:								

FEBRUARY 12, 2001 PSTA DESTRUCTIVE SAMPLING EVENT - CON

Chain of Custody Form PSTA CH2M HILL

COC Number:	P260	Project: H	Project: HYTON-BASED STORMWATER	STORMW	سرا	TMENT ARE	TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR KIT Request ID:	DEMONSTRATION PR	Kit Re	luest ID:
Project #:	148010.01.05.CH	.05.СН	Labora	Laboratory Coordina	dinator:	Ellen l	Ellen Patterson / USA 954.426.6112 x233	26.6112 ×233	Lab:	PPB
			Date & Time			Number of				
Sample ID	Station ID		Collected		Matrix	Containers	Analysis	Analysis Requested		Comments
PP-3-CON	PP-3-COA	PP-3-CON 021561		1430	Ħ	1	AFDW, Ca++, DWght	A	_	202533
PP-5-CON	PP-5-CON	PP-5-CON 02.501		320	ㅌ	-	AFDW, Ca++, DWght			534
PP-10-CON	PP-10-CON	N 031501		1445	F	-	AFDW, Ca++, DWght			525
PP-12-CON	PP-12-CO	PP-12-CON ODITA		1510	Ħ	1	AFDW, Ca++, DWght	7	7	236
PP-14-CON	PP-14-CO	PP-14-CON D2150		752	F	-	AFDW, Ca++, DWght			577
PP-17-CON	PP-17-CON	NO SYCH		325	Ħ	1	AFDW, Ca++, DWght	0/5/5	2	538
PP-19-CON	PP-19-CO	PP-19-CON CONSON		1300	FT	1	AFDW, Ca++, DWght	1 21		665
PP-20-CON	PP-20-CON	S S S		13/0	FT	1	AFDW, Ca++, DWght	200		270
PP-21-CON	PP-21-CON	-	1 - 105160	1235	FT	1	AFDW, Ca++, DWght	_	اِد	テク
PP-22-CON	PP-22-CON	-	2	1635	FT	1	AFDW, Ca++, DWght			543
PP-FD1-CON	PP-FD1-C(PP-FD1-CON COLSO		215	ㅂ	ļ	AFDW, Ca++, DWght	7		F 5V3
									- 1	
									- :	

, , , , , , , , , , , , , , , , , , , ,	Custody Spoil: V / N Delinaulehed By:	Delinaniehed Rv.	Date / Time:
LIDE EASTE Mand Other/releases enective:	Custouy Seal. 1 / IN	Neimiquisited by.	
1 2	Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:
Date / Time: 2/14/01/7 0 Gooler Temp: Custody Sea(?) / N Relinquished By:	Custody Sea(7) / N	Relinquished By:	Date / Time:
W.			

FEBRUARY 12, 2001 DESTRUCTIVE SAMPLING EVENT - UPR

CH2M HILL Chain of Custody Form PSTA

Project #:	148010.01.05.CH	5.СН	Laboratory Coordin	rdinator:	filen F	Filen Patterson / USA 954.426.6112 x233		Lab:	
•		Da	Date & Time		Number of				
Sample ID	Station ID	0	Collected	Matrix	Containers	Analysis Kequesked	nesteo		i
PP-3-UPR1	PP-3-UPR	104/80	2815	ď	~	PSOLIDS, BD, Ca++			202344
PP-3-UPR2	PP-3-UPR	104160	3180	G	r	PSOLIDS, BD, Ca++		10 Samaie	בל
PP-6-UPR1	PP-5-UPR	02/401	0401	ď	84	PSOLIDS, BD, Ca++		2.	242
PP-5-UPR2	PP-5-UPR	10H10	1045	ď	7	PSOLIDS, BD, Ca++			247
PP-10-UPR1	PP-10-UPR	81.60	52.57	ď	7	PSOLIDS, BD, Ca++			278
PP-10-UPR2	PP-10-UPR	107140	7837	dd	7	PSOLIDS, BD, Ca++			ζ
PP-12-UPR1	PP-12-UPR	1911	0461 -	рр	2	PSOLIDS, BD, Ca++			22
PP-12-UPR2	PP-12-UPR	32146	Shel	ЬР	2	PSOLIDS, BD, Ca++	_		らら
PP-14-UPR1	PP-14-UPR	22150	13/5	ЬР	2	PSOLIDS, BD, Ca++			552
PP-14-UPR2	PP-14-UPR	3	4151	ЬÞ	2	PSOLIDS, BD, Ca++	いいフノ		2
PP-17-UPR1	PP-17-UPR	195,50	1435	dd	2	PSOLIDS, BD, Ca++	101		23
PP-17-UPR2	PP-17-UPR	000	1	d d	7	PSOLIDS, BD, Ca++			22
PP-19-UPR1-	PP-19-UPR	021301	-	ЬР	7	PSOLIDS, BD, Ca++			200
PP-19-UPR2	PP-19-UPR	021301	1400	ď	2	PSOLIDS, BD, Ca++			22
PP-20-UPR1	PP-20-UPR	02130	1030	ЬР	2	PSOLIDS, BD, Ca++	_		238
PP-20-UPR2	PP-20-UPR	021301	1035	ЬР	2	PSOLIDS, BD, Ca++			525
PP-FD1-UPR	PP-FD1-UPR	021301	#OH1	ЬЬ	2	PSOLIDS, BD, Ca++			260
PP-FD2-UPR	PP-FD2-UPR	107160	١	ЬР	2	PSOLIDS, BD, Ca++		>	23
PP-EB1-UPR	PP-EB1-UPR	021401	11.5	WQ	-	C3++ W	7017	202	4
PP-EB2-UPR	PP-EB2-UPR	1	1176	WQ	-	Ca++		3	K
DD	2	1		Į	Ç				
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	4					en e		·	
Sampled By:	1	Dat	Date / Time: 2 ////	19	20,2	Custody Seal: Y / N	Relinquished By:	Date / Time	je:
Shipped Via: /	UPS FedEx Hand	l	Other (please spec 'y):						
Received By:	187	Dat	Date / Time: 3/16/01	Coole	Cooler Temp:	Custody Seal: Y / N	Relinquished By:	Date / Time:	эе:
Received By:	000	Dat	Date / Time: 3/6/11	Cool	Cooler Temp:	Custody Seal: Y / N	Relinquished By:	Date / Time:	Je:
Remarks:			-						1

FEBRUARY 12, 2001 DESTRUCTIVE SAMPLING EVENT - LWR

CH2M HILL
Chain of Custody Form

PSTA

HILL Stody Form

(6108) | 1010Generated on: 02/02/2001 4:38:04 PM

Date / Time: Date / Time: Date / Time: 8 0 Q Comments PPB 200 A Kit Request ID: Lab Project: HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR Relinquished By: Custody Seal: Y / N Relinquished By: Relinquished By: Ellen Patterson / USA 954.426.6112 x233 **Analysis Requested** Custody Seal: Y / N Custody Seal: Y / N CA_S, PSOLIDS, BD CA 'S, PSOLIDS, BD CA_S, PSOLIDS, BD CA_S, PSOLIDS, BD CA_S, PSOLIDS, BD CA_S, PSOLIDS, BD Ca++ Ca++ Number of Containers Cooler Temp: Date / Time: 2/16/c/ 1300 Cooler Temp: в Laboratory Coordinator: W ď 급 유 ם d 4 dd 읍 dd ď dd PP 113640 Date / Time: 2//U 4204 1251 515 Other (please specify): 7255 0828 1157 7401 1545 1735 1045 1540 तरा 0823 0220 1045 FH 01 1040 1410 1405 Date & Time Collected Date / Time: PP-EB2-LWR 021401 PP-EB1-LWR OLITO 01/10 PP-17-LWR 0215TO 02130 CH1C0 101720 PP-FD3-LWR O21401 021431 02,5p 02/20 PP-20-LWR 021301 031491 105120 521201 PP-12-LWR 621401 PP-14-LWR 33.50 PP-20-LWR | 021301 107/00 PP-12-LWR O21481 32,50 148010.01.05.CH UPS FedEx Hand PP-FD1-LWR PP-19-LWR PP-FD2-LWR PP-17-LWR PP-10-LWR PP-10-LWR PP-14-LWR PP-19-LWR PP-5-LWR PP-5-LWR PP-3-LWR PP-3-LWR Station ID P247 PP-FD1-LWR PP-FD2-LWR PP-EB1-LWR PP-EB2-LWR PP-FD3-LWR PP-12-LWR2 PP-17-LWR2 PP-19-LWR1 PP-19-LWR2 PP-20-LWR1 PP-20-LWR2 PP-10-LWR1 PP-10-LWR2 PP-14-LWR1 PP-14-LWR2 PP-12-LWR1 PP-17-LWR1 COC Number: Project #: PP-3-LWR1 PP-3-LWR2 PP-5-LWR2 Received By: Sample ID PP-5-LWR1 Shipped Via: Sampled By: Received By: Remarks:

FEBRUARY 12, 2001 PSTA DESTRUCTIVE SAMPLING EVENT - MAC

CH2M HILL

Chain of Custody Form

Cenerated on: 02/02/2001 4:41:11 PM

PSTA

Project: HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR Kit Request ID: Lab: Ellen Patterson / USA 954.426.6112 x233

P256

COC Number:

Comments 125 なられて 000 6 202616 62 **Analysis Requested** AFDW, Ca++, DWght AFDW, Ca++, DWghi Number of Containers Laboratory Coordinator: Matrix ž ဋ S S S S **∑** S ğ 2 ဋ 2855 250 1620 029 E 08.55 C 1405 500 165 707 1233 2250 7233 150 1156 1150 Date & Time Collected PP-20-MAC 02/30 8 525 OSISS PP-20-MAC 02/36 PP-FD1-MAC 021401 07140 02/43 PP-12-MAC OLLYDI PP-FD2-MAC OJ 1401 PP-14-MAC D215D PP-10-MAC 021401 PP-19-MAC | O21401 PP-3-MAC 021401 105160 PP-10-MAC | 021401 102150 र्लनार्ट 148010.01.05.CH PP-12-MAC PP-17-MAC PP-19-MAC PP-14-MAC PP-17-MAC PP-5-MAC PP-3-MAC PP-5-MAC Station ID PP-FD1-MAC PP-FD2-MAC PP-12-MAC2 PP-17-MAC2 PP-10-MAC2 PP-14-MAC1 **PP-14-MAC2** PP-19-MAC1 PP-19-MAC2 PP-20-MAC2 Project #: PP-10-MAC1 PP-12-MAC1 PP-17-MAC1 PP-20-MAC1 PP-3-MAC2 PP-3-MAC1 PP-5-MAC1 PP-5-MAC2 Sample ID

Sampled By: // Date / Time: 2 // Loby (2 Cooler Temp: Custody Seal: Y / N Relinquished By: Date / Time: Date / Time: Received By: Cooler Temp: Custody Seal: Y / N Relinquished By: Date / Time: Date / Time: Received By: Cooler Temp: Custody Seal: Y / N Relinquished By: Date / Time: Remarks:					
UPS FedEx Hand Other (please specify): (Color Temp: Custody Seal: Y / N Relinquished By: Date / Time: Cooler Temp: Custody Seal: Y / N Relinquished By:	Sampled By: 1000	Date / Time: $2//c/b$	1 (2 cm	Custody Seal: Y / N	Time:
Date / Time: 2/16/0/ 1201 Cooler Temp: Custody Seal: Y / N Relinquished By: Custody Seal: Y / N Relinquished By:	┺.	Other (please specify):			
By: Cooler Temp: Custody Seal: Y / N Relinquished By:	Received By: C. C. 1.	Date / Time: 2/16/0/ (30)	Cooler Temp:	Custody Seal: Y / N	Time:
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	Remarks:				

FEBRUARY 12, 2001 PSTA DESTRUCTIVE SAMPLING EVENT - RTS

CH2M HILL Chain of Custody Form 10114 TWE Generated on: 02/02/2001 4:42:29 PM PSTA

equest ID:	PPB	***************************************
Kit Rec	Lab:	J
MMATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR Kit Request ID:	r: Ellen Patterson / USA 954.426.6112 x233	
Project: HYTON-BASED STORMWATER TRE	Laboratory Coordinator:	
Project: H	148010.01.05.CH	
P258		
COC Number:	Project #:	

	Comments	303634	U.	5	40	7	\$	23	C C d	מ	7.0	7,	48	200		9	52	53	24		
	Analysis Requested	AFDW, C&++, DWght	AFDW, Ca++, DWght																		
Number of	Containers	1 م	1 4	1 4	1 ۸	1	1	1 A	1	1	1 م	1	1 4	1	1 4	1 م	1	1	1 4		
	Matrix	MC	MC	MC	S W	SE SE	Ş	MC	¥C	Ş	¥	MC									
Date & Time	Collected	१५३३	1933	7141	7141	2047	224	09/00	0900	(632	8/	cot	1300	2000	3913	1155	1155	15/150	\233		
Date 8	Coll	(0)/10)	104120	67/20	0.2143	52140	165120	500	201501	021501	المكادرة	03:30	22150	(CH/60	いっていての	108120	105120	104120	104120		
	Station ID	PP-3-RTS	PP-3-RTS	PP-5-RTS	PP-5-RTS	PP-10-RTS	PP-10-RTS	PP-12-RTS	PP-12-RTS	PP-14-RTS	PP-14-RTS	PP-17-RTS	PP-17-RTS	PP-19-RTS	PP-19-RTS	PP-20-RTS	PP-20-RTS	PP-FD1-RTS	PP-FD2-RTS		
	Sample ID	PP-3-RTS1	PP-3-RTS2	PP-5-RTS1	PP-5-RTS2	PP-10-RTS1	PP-10-RTS2	PP-12-RTS1	PP-12-RTS2	PP-14-RTS1	PP-14-RTS2	PP-17-RTS1	PP-17-RTS2	PP-19-RTS1	PP-19-RTS2	PP-20-RTS1	PP-20-RTS2	PP-FD1-RTS	PP-FD2-RTS		

100				
Sampled By: // /	Date / Time: 2 // 6/0/	3~	Custody Seal: Y / N Relinquished By:	Date / Time:
Shipped Via: UPS FedEx Hand Other (please specify):	nd Other (please specify):			
Received By: FM. Chard	Date / Time: 2/16/6/ / 300	Cooler Temp:	Custody Seal: Y / N Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Custody Seal: Y / N Relinquished By:	Date / Time:

Destructive Sampling Field Sheet Porta-PSTA Cell Monitoring Periphyton-Based Stormwater Treatment Area (PSTA) Project

_									148010.	P2.06.CH						
										-				Sta	aff	
F	Porta-PSTA		3	5 1	0	12	14	17	19	20	21	22		Ga	uge (in):	
	Field Team:		<u>-</u>							-						
ι	Date/Time:									-						
-	· . · · · · · · · · · · · · · · · · · ·			·						 						
1	Periphytor	n·	28.0		-loatin etaphy		2	14/	'all		Bor	ıthic	-	EndWall eriphyton		
	Total Volume			Ly 30	1.7 \	u e Ma	Ŷ		<u>an</u> + \	1221		6 kg 16		G)	©	
	/ol.Subsam		S):	30	700	~/ 	MAN.	<u>ماما</u> _		<u>,, , , – </u>	72	0	Inflow:	255	_245	ر رون مرع د
-		l added (m			300			340		-		10		40	30	
		Subsamp			000			100	o	_	<u>61</u>	00	Odifiow	295	_275	30
<u> </u>	ol-Subsam				66			2		_						260
		l added (m	•		340			230		-	<u>ંચ</u>		outher	300. د	230	140
	: Total Vol. Field Duplica		e 2:		00	<u> </u>		(70)		-	01	00		40	20	40
•	icia Daplica	atc.					,	74	<u></u>	-				340	250	180
7	Macrophy	tes:		Ab	ove G	rounc	l Port	ion (a)	TOTAL	\ \ X \ \			Below	Ground F	Portion (g)	
-			Empt			Conta			13 to	14.521	ىچ .	Em		Contain		
			Contair		-	nd sa			San	nple		Conta		and sam		Sample
/ml/	Total Weigh		2		L	dit	13.5	30	216	2.81 2	**	l		316411	33	116.110
0	Wt. Subsar		12			89				79		12		<u> 39</u>		675
la	Wt. Subsar Field Dupl		75	<u></u>		98		-		لاي	•			<u>80</u>		<u> 689 </u>
	riela Dupi	iicates:	12	FD3		30		•	<u></u>	<u> </u>	•	<u> </u>	FD2	131		<u> </u>
9	Species Pres	sent		Percen	ıt.		:naci	es Pres	ent		Por	cent	Snaci	es Present	· *	Percent
	JP 00100 1 10	oon		reroen	<u></u>	2	pcon	JJ 1 100	CIIC		<u></u>	ociic	Opcon	23 1 103011		10.00
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-				• • • • • • • • • • • • • • • • • • • •												
_	<u>Animals:</u>	<u>Spe</u>	ecies			No. Ir	<u>ndivid</u>	luals					<u>Tota</u>	l Weight (g)	
Ī	<u>Fish</u>								•	Emate	Contr	inor				
						13			•	Empty		nner d samp	صا			
5	Snails	Heli	SO	h/1	1.	-31		- 3	-	Sampl			***************************************	1xa 10.	102	
		P	كمما	<u>~</u>	<u>ا</u>	- K	16		-	•			***************************************			
9	<u>Others</u>				_				•	Total \	/olume	(units)				
	0 - 4!4	.														
· ** ** * * * *	<u>Sediment*</u>	Ë	_						_							
7.2)-10cm : Total W					m San I Weigi				m Sample 1 Weight (g))-20cm San Total Weigh	
E	Empty Conta	ainer	•	TOTAL TV	eigni	777		1018	ii weiqi	11(14)		IUlai	Weight (g)	1	Otal Weigi	11 (4)
	Container an		_								•			-		
	Sample (てo	+cul.	3	542	$\sqrt{2}$	LOL					•	10.03	kg/3.1	L _		
						,						<u></u>				
	Total Volume	e (units)		FD.T.	-0 KA							LD.	2 U2R			
			-	iold Dec	- C							Uaris	on Marker	u	oriz.Marke	r Dun
				ield Du Total W									on Marker Weight (g)		Total Weigh	
ε	Empty Conta	ainer	•	TOTAL TV	cigitt	777						Total	Treight (4)	-	rotal treigi	11111
	Container an						-•							· —		
5	Sample															
7	Fatal Values	n (senita)														
	Fotal Volume Composited sa		0 locatio	nds: 3 loc	ations f	from No	rth zor	ne 4 loc:	ations for	om Cent	er zone	3 location	s from South 7		··· ··-	
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C	Comments:	7.8√8	MAC					781	TP R1		429					
		181		30				778	RTS		44 6					
5	Signature:	_FDZ	MAL	23	3 <u>4</u> _			D25	275		185					
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	P.1148010 PST	A Cost Fieldsheet	s:PP Fields	heels\Destruc	circe			Pag	e	_ of _						R, 013101℃

P\148010 F'STA Field Fieldsheets PP Fieldsheets Destructive

Destructive Sampling Field Sheet Porta-PSTA Cell Monitoring Periphyton-Based Stormwater Treatment Area (PSTA) Project

											Staff	
Porta-PSTA 3	5 10	12	14	17	19	20	21	22			Gauge (i	in):
Field Team:												
Date/Time: 2 - 13 - (01					•						
	-]					•						
	Fle	oating/								<u>EndWa</u>	<u>u</u>	
<u>Periphyton:</u>		<u>aphyton</u>			<u>all</u>			<u>nthic</u>	SUTFA	Periphyt	<u>on</u>	_
otal Volume (units):		15.00 L	. 5.		<u>(5.75)</u>	15 Z		<u> 1731.0</u>	L de	A I	B	C
ot Subsample:) (units): Vol. DI added (mls)		<u>5</u>	•		20 20	-	<u> 18</u>		****	475	<i>−£</i> ∞	190
Total Vol. Subsample1		∞	•		10	•	10:		Outf	lew: 45	- 10	25 215
ol Subsample 2 (units):	3 60	Ø			0			35		<u></u>	510	215
Vol. Di added (mis)		0	•	36		-		<u>65</u>	inci	135	180	100
Total Vol. Subsample 2 Teld Duplicate:	1 a	00	•	100	20_	•	76	00	inslov	1/20	30	ં ૩૦
iela Daplicate.			•			•				Liss	310	130
Macrophytes:	Abo	ve Grou	nd Port	ion (g)					B	elow Grou	nd Portio	n (g)
-	mpty	Cont	tainer					Em			tainer_	_
	ntainer		ample			nple		Conta			ample	<u>San</u> 1 \b
Total Weight (Wet) 2, 3 Wt. Subsample 1: 12	الحال		802	•		. 3.20	3	3.311	o5.	138	<u>3 c</u> 3 <u>7 7 0 8</u>	116 1269
Wt. Subsample 2:	262	<u> </u>		•	<u>-99</u>		-	V		-13		79°
Field Duplicates:	4			•		5	-				2	
Total Ut wet 6.	1645											_
Species Present	Percent		Specie	es Pres	sent		Pe	rcent	<u>S</u> r	ecies Pre	<u>sent</u>	<u>Per</u>
						-						
	****	_				-			-			
tod pole	<u></u>		Individ	luals						Total Weig	(ht (g)	
offer Dancell		$\sim \frac{1}{3}$		luals				ainer nd samp		Total Weig	(ht (g)	
Smalls Tod pole Domers Drayes Helisone Physical		$\sim \frac{1}{3}$		luals	- -	Conta Samp	iner a le	nd samp	ile			
Dansels Drayers HKlissers Physical		$\sim \frac{1}{3}$		luals	-	Conta Samp	iner a le		ile	Total Weig		
Others Tod pole Dansell Drayof Rhyse Others		$\sim \frac{1}{3}$		luals	-	Conta Samp	iner a le	nd samp	ile) L
Drayore Snalls Physical Others		\(\frac{1}{2}\)			- - - - - -	Conta Samp Total	iner a le	nd samp	ole	,031 \ <u> </u>	10-20c	m Sample 2
Sediment*:		ample 1		0-10	- - - - - cm Sar	Conta Samp Total	iner a le	nd samp	ole	,031 \ <u> </u>	10-20c	
Snalls Democrit 0-10cm S	ample 1		0-10		Conta Samp Total	iner a le	nd samp	ole	,031 \ <u> </u>	10-20c	m Sample 2	
Dankills Dithers Sediment*: Empty Container Container and sample	0-10cm S	ample 1		0-10		Conta Samp Total	iner a le	nd samp	ole	,031 \ <u> </u>	10-20c	m Sample 2
Sediment*: Empty Container Container and sample	0-10cm S	ample 1		0-10		Conta Samp Total	iner a le	e (units)	ole	.031 \ c	10-20c	m Sample 2
Snalls Drought Snalls Physic Physic Sediment*: Empty Container Container and sample Sample Total Volume (units)	O-10cm S Total We	ample 1		0-10		Conta Samp Total	iner a le	e (units) 10-20 Tota	ole	(9)	10-20c Total	m Sample 2
Snalls Drought Snalls Physic Physic Sediment*: Empty Container Container and sample Sample Total Volume (units)	O-10cm S	ample 1		0-10		Conta Samp Total	iner a le	e (units) 10-200 Tota	cm Samp	(0) (e) (er	10-20c Total Horiz.	m Sample 2 Weight (g)
Snalls Drays Drays Snalls Physic Physic Cothers Sediment*: Empty Container Container and sample Sample Total Volume (units) Empty Container	O-10cm S Total We	ample 1		0-10		Conta Samp Total	iner a le	e (units) 10-200 Tota	cm Samp I Weight	(0) (e) (er	10-20c Total Horiz.	m Sample 2 Weight (g) Marker Dup
Eight To pole Danwill	O-10cm S Total We	ample 1		0-10		Conta Samp Total	iner a le	e (units) 10-200 Tota	cm Samp I Weight	(0) (e) (er	10-20c Total Horiz.	m Sample 2 Weight (g) Marker Dup
Eight To pole Danwill	O-10cm S Total We	ample 1		0-10		Conta Samp Total	iner a le	e (units) 10-200 Tota	cm Samp I Weight	(0) (e) (er	10-20c Total Horiz.	m Sample 2 Weight (g) Marker Dup
Eight To pole Daniells District To pole Daniells District To pole Daniells District To pole Daniells Physical Physic	O-10cm S Total We	ample 1 ight (g) Sample		0-10 Tota	al Weig	Total mple 2 ht (q)	iner au	e (units) 10-200 Tota 以れる	em Samp I Weight	(a) (er (g)	10-20c Total Horiz.	m Sample 2 Weight (g) Marker Dup
Eight To pole Dangel Smalls Helisand Physics P	O-10cm S Total We Sield Dup Total We	ample 1 ight (g) Sample		0-10 Tota	al Weig	Total mple 2 ht (q)	iner alle Volum	e (units) 10-200 Tota U. به ماله الماله ا	em Samp I Weight	(a) (er (g)	10-20c Total Horiz.	m Sample 2 Weight (g) Marker Dup
Snalls Drought Snalls Physic Others Sediment*: Empty Container Container and sample Sample Fotal Volume (units)	O-10cm S Total We Sield Dup Total We	ample 1 sight (g) Sample sight (g)		0-10 Tota	al Weig	Total Total mple 2 ht (q)	iner au	e (units) 10-200 Tota U. به ماله الماله ا	em Samp I Weight	(a) (er (g)	10-20c Total	m Sample 2 Weight (g) Marker Dup

PN::=010 FSTAField/Fieldsheets\PP Fieldsheets\Destructive

Destructive Sampling Field Sheet Porta-PSTA Cell Monitoring Periphyton-Based Stormwater Treatment Area (PSTA) Project

						<u>148010.P</u>	2.06.CH						
Porta-PSTA 3	3 5	(10)	12	14	17	19	20	21	22		Staff Gauge	e (in):	
	-	O									•	` '	
Field Team:	111 0												
Date/Time: 02	·14·01	<u> </u>											
		Floa	ting/							E	ndWall_		
Periphyton:	_		hyton		W		f.v		ithic		riphyton	16	
Total Volume (units): Vol. Subsample 1. (units	s):	20.68 \ 7407		6L 1	40 700 F		L 4	49°	138.231	Inflow:	\mathcal{A}	B	
Vol. DI added (m	ls):	29	8		29	4		<u> 30</u>	3	•	290	262	208
Total Vol. Subsample Vol. Subsample 2 (unit		<u>690</u>		•	<u>100</u>			<u>100</u>		Outflow:			
Vol. DI added (m		30			310			30		DARI-	~ 222	273	262
Total Vol. Subsample Field Duplicate:	2 :	100	<u>s</u>	-	100	<u> </u>		<u> 10:</u>	<i>p</i>	0 2110	2 225		
rieiu Duplicate.				•									
Macrophytes:		Above			tion (g)						Ground Port	ion (g)	
_	Empty ontainer			<u>ainer</u> ample		San	nnla		Emp Contai		Container and sample		Sample
Total Weight (Wet)	2.016			loz		Jan	ipie	_	2.31	b	4.0165		<u>Jumpio</u>
Wt. Subsample 1:	129	-	Was					-	<u></u>	1;	44.016	<u></u>	
Wt. Subsample 2: Fleid Duplicates:	123	_	75	5	-			-	13		494		
Total W Colver	20.731	-s Pr	oussi	D: 3.0	Mkg.			•		••••			
Species Present	<u>Pe</u>	rcent		Speci	es Pres	ent		<u>Per</u>	cent	Specie	s Present		Percent
			-									· –	
			•										
Animals: Spe	cies			<u>Indivi</u>	duals					<u>Tota</u>	Weight (g)		
	~ ~~	<u>~</u> ~		1			Empty	/ Conta	ainer			_	
Bur	e laru	<u>a</u> e		`		-	Conta Samp		d sampl	e		-	
Snalls Helisa		_		<u>3</u>			Samp	ic				-	
Others		_					Total '	Volum	e (units)	Q 10	1210,00	Ī-	
Sediment*:	······································												······································
	<u>0-10</u>	om San	nple 1		<u>0-10c</u>	m San	nple 2		10-20c	m Sample 1		cm Sam	
Frants Contains	Tot	al Weig	<u>ht (g)</u>		Tota	l Weigl	<u>ht (a)</u>		Total	Weight (g)	Tota	al Weight	<u>(a)</u>
Empty Container Container and sample				-				-					
Sample				_				-					
Total Volume (units)	٥,	02 لار	15.01	-					F03	LMR			
,			, 5,0	-				-		mg 155L			_
	-	d Dup S								on Marker Weight (g)		<u>z.Marker</u> al Weight	
Empty Container	101	tal Weig	ut (d)						Total	Weight (g)			
Container and sample				-									
Sample				-									
Total Volume (units)				-									
*Composited sample from 1	0 locations	: 3 locatio	ns from	North ze	one, 4 loc	ations fr	om Cent	ter zone,	3 location	s from South zo	ne.		
Comments: P2.	07.2	7 W	77	آ وا		10 m		<u> </u>	738	* Wt 9	<u> </u>	PAP	mac
Signature:	· 0/4L	<u> </u>	<u> </u>	9	TY K	JS_	/ P	<u>ــ - ۷</u>	145	WT IS	mg II	יוץ	IVK1S
							· ·					-	
PN:::::19 FSTA/Field/Fieldsheet	s/PP Fieldsheet	s\Destructive			Pag	e	_ of _						Higy 013101fb

Destructive Sampling Field Sheet Porta-PSTA Cell Monitoring Periphyton-Based Stormwater Treatment Area (PSTA) Project

						148010.	P2.06.CH	(
Porta-PSTA 3	5	10	<u> </u>	4.4	47	40	20	01	00		Staff	
PORA-PSTA 3	5	10	(12)	14	17	19	20	21	22		Gauge (in):	
Field Team:				_								
Date/Time: 2.14.	٥١		S				•					
							•					
		Floa	ating/							EndW	all_	
Periphyton:		Meta	phyton		W	<u>all</u>		Ben	thic	Periphy		0
Total Volume (units):	(1955)		-	C			3 L					
Vol. Subsample:) (units Vol. DI added (ml		-H	ζ					_7/2	<u></u>		551 450	५ ५४४
Total Vol. Subsample							•				92	
Vol. Subsample 2 (units		NP					•	NR		pullow.		
Vol. Di added (mi							44	-137		2 :watteo	169 48C	404
Total Vol. Subsample	2:									00,000	• ,	
Field Duplicate:												
Magraphidae												
Macrophytes:	Empty	Abov			tion (g)				F		ınd Portion (g)	
	ontainer					San	nnla				<u>ntainer</u> sample	Sample
Total Weight (Wet)					•						902 1	316 11 c
Wt. Subsample 1:		-							777. 1.1	100	·	288
Wt. Subsample 2:	(23	-			_ :	10)				139	<u> </u>	1235
Field Duplicates:		-		<u> </u>			ر 					
Total W4: 21.721	•											
Species Present	Per	cent		Speci	es Pres	<u>ent</u>		Per	cent	Species Pre	<u>sent</u>	<u>Percent</u>
							•			-		
							•			-		
Animals: Spec	ies		No. I	ndivi	duals					Total Wei	ght (g)	
Fish Stripe (_		١						•		
Janes -		_	7	_0						****		
Snails Surviv		-		<u> </u>					d sample	e		
Snails Lk/150		-					Sampi	e		******C=		
Others	,	-					Total \	/olume	(units)	751.CC		
		•							(-MEGNEY	10,51	
Sediment*:												
											10-20cm Sa	
5	<u>Tota</u>	l Weig	<u>ht (g)</u>		Total	Weigl	<u>ht (g)</u>		Total '	Weight (g)	Total Weig	ht (g)
Empty Container Container and sample												
Sample												
												
Total Volume (units)	3.12	x 12.	8L						1.992	(1.56		
		,										
		Metaphyton Wall Benthic Percent Species Present Percent Species Present Species Present Sample Sample Sample Sample Sample Species Present Species Present Species Present Sample Sample Sample Sample Species Present Species Present Species Present Species Present Species Present Species Sample Sa		Horiz.Marke								
Empty Contains	<u>Tota</u>	l Weig	<u>ht (g)</u>						<u>Total</u>	Weight (g)	Total Weig	ht (g)
Empty Container Container and sample												
Sample												
•	***************************************											
Total Volume (units)												
* Composited sample from 10	locations: 3	3 locatio	ns from N	orth zo	ne, 4 loca	tions fro	om Cente	er zone,	3 locations	from South zone.	-	
Comments: T.O ITC		50.4				τ.	₩ ∩ ~	Α,	3° 20~√7	• · •		
Comments: The state of the stat	MAC MAC		امر			-176	125 7	275	30) 	 .	
Signature:	~~~	30	5				(K))		
												

Destructive Sampling Field Sheet Porta-PSTA Cell Monitoring Periphyton-Based Stormwater Treatment Area (PSTA) Project

			_											
Porta-PSTA	3	5	10	12	14)	17	19	20	21	22		Staff Gaug	je (in):	
	•	•			٠	-		e						
Field Team:								•						
Date/Time:		٠ ١५	.91					-						
Total Volume (units	Chara		<u>Metap</u> الا <i>لحر ا</i>	9.46	<u> </u>	<u> ۱۲۵۰.</u>	<u>(all</u> しょうの	L '	1851 kg	1/8/22	<u>Pe</u>	EndWall eriphyton	340	© 7.0
Vol. Subsample it (U Vol. DI added Total Vol. Subsa Vol. Subsample 2 (U	d (mls): mple1:		<u>P1</u> 185 1001 127	5	- - -	75 70 77 37	<i>ک</i>	• •	700 - 700 - 3-3	<u>٩</u> ٥٥	Qutflow:	301 331	_270	309
Vol. DI added Total Vol. Subsar Field Duplicate:			44.		- - -	100		- - -			<i>о</i> л.	_	461 30 PI 491	459
Macrophytes:	Em	ata c	Above		nd Port					Emp	· · · · · · · · · · · · · · · · · · ·	Ground Por Container		
アン・アット・アット・アット・アット・アット・アット・アット・アット・アット・アット	. <u>Conta</u>	iner		and s	ample مرکار		<u>ارم (Sar</u> ارم (Sar	nple Y _o z 3 q		Conta		and sample	2	Sample 11/133
Wt. Subsample 2: Field Duplicates:				_\\	16	•	7.8	48	-			126	-	<u> 1445</u>
★ lors at a Species Present			cent	0/5		es Pres		<u> </u>	Per	cent	Specie	es Present	_	Percent
Animals: Fish	Species	 	<u> </u>	No.	Individ	luals					Tota	l Weight (g)		
				٠			-	C	Camta	lma.				
Snalls \	el150~	~~	•		73		- - -			iner d sampl	e		<u>-</u>	
			•		73	111111111111111111111111111111111111111	- - -	Conta	iner an le			6 kg 10.01	_ _ <u></u>	
Others Dro	eliso~ ozo~ i		•		73		-	Conta	iner an le	d sampl		62g 10.01	- - <u>6</u> L	
	مری ،	<u>0-10</u> €	cm Sam	nple 1	73		- - - - - cm San	Conta Samp Total	iner an le	d sample (units)		10-2	20cm Sar	
Others Dro	مری ،	<u>0-10</u> €	m Sam	nple 1	73			Conta Samp Total	iner an le	d sample (units)	<u>ი</u> ,თ	10-2	Ocm Sa	
Others Sediment*: Empty Container Container and sam	ple	0-10c Tota	cm Sam I Weigl	nple 1 ht (g)	73			Conta Samp Total	iner an le	d sample (units) 10-20c Total	<u>ი</u> ,თ	10-2 To	Ocm Sa	
Others Sediment*: Empty Container Container and sam Sample Total Volume (units	ple	0-10c Tota	cm Sam	nple 1 ht (q)	-			Conta Samp Total	iner an le	(units) 10-20c Total	ტ, თ ტ, თ m Sample 1 Weight (g)	10-2 To	Ocm Sa	er Dup
Others Sediment*: Empty Container Container and sam Sample Total Volume (units	ple	0-10c Tota	em Sam il Weigh	nple 1 ht (q)	-			Conta Samp Total	iner an le	(units) 10-20c Total	ののう Meight (g) Welght (g)	10-2 To	20cm Sar tal Weig	er Dup
Others Sediment*: Empty Container Container and sam Sample Total Volume (units Empty Container Container and sam	ple ple	0-10c Tota 2.38	cm Sam I Weigl	ample ht (g)		Tota	al Weig	Conta Samp Total nple 2 ht (q)	ainer an ele Volume	d sample (units) 10-20c Total Horiz Total	ののう m Sample 1 Weight (g) con Marker Weight (g)	10-2 To	20cm Sar tal Weig	er Dup
Others Sediment*: Empty Container Container and sample Total Volume (units) Empty Container Container and sample Total Volume (units)	ple	0-10c Tota 2.38	Dup Sall Weigh	nple 1 ht (g)	North zo	Tota	al Weig	Conta Samp Total nple 2 ht (q)	ter zone,	d sample (units) 10-20c Total Horiz Total	ののう m Sample 1 Weight (g)	10-2 To	20cm Sar tal Weig	er Dup

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Destructive Sampling Field Sheet Porta-PSTA Cell Monitoring Periphyton-Based Stormwater Treatment Area (PSTA) Project

						148010.	P2.06.CI	1					
											Sta	aff	
Porta-PSTA 3	5	10	12	14	(17)	19	20	21	22			uge (in):	
TOTAL OTA	•		12	17			20	2.1			Ge	uge (III).	
Field Team:							-						
Date/Time:	201						-						
 		Floati	ina/				•			E	ndWall		
Periphyton:		Metaph			Wa	alí		Re	nthic	_	riphyton		_
Total Volume (units):	_	58 mg 1					~		<u>۱۱۱۱۱۵</u> در ۲۲۰۱۴۱		6	\mathcal{D}	\bigcirc
Vol. Subsample 1 (units):		_	_	L	<u>578</u> 7		745			Inflow:	340		349
Vol. DI added (mis)		<u> 270</u>					-		51	millow.	عريد	<u> </u>	376
` '		1022			1219		-		4 2—	0.46			
Total Vol. Subsample1		20			160	<u> </u>	-	عود		Outflow:			
Vol. Subsample 2: Units):		_*_			*		-		<u>න</u>				
Vol. DI added (mls)		50.~		whi			_		<u> </u>	∞ .	213	494	469
Total Vol. Subsample 2		·C 21					_		<u>ာ</u>	ب نجي	J (0	• • • •	(4)
Field Duplicate:		455	<u>2</u>				-						
<u>Macrophytes:</u>	<u> </u>	Above	Groun	d Por	tion (g)					Below	Ground I	Portion (g	Ŋ
04x1 24.05 Kg En	npty		Conta	iner					Empt	Y	Contain	er	
CONTRACTOR 1.50 KZ. Con	tainer	;	and sa			San	nple		Contai	ner ·	and sam	ple	Sample
			4165				300		214		2130 8		80+
Wt. Subsample 1: \7			145			13		-			106 c		949
Wt. Subsample 2:	<u> </u>	-	177				<u> </u>	-			100		885
Field Duplicates:	¥	-		}			-2-	-			100		
		_						-					
Species Present	Doros			Casal	D			D.	roomt	Cassi	s Presen		Percent
Species Present	Perce	2111		Speci	es Pres	ent		Pe	rcent	Specie	S Pieseii	<u> </u>	reicein
			-				-					—	
			-				-		 .				
A - 1 1 -													
Animals: Specie				ndivi	duals					Tota	l Weight (a)	
Fish Stipe Si		_	7,										
_ ta2 gol		_		<u> </u>				y Cont					
									nd sample				
Snails Helison	<u>c</u>	_		اله			Samp	le					
- Physa-		_		5_									
Others Dracan	Mangh	_					Total	Volum	e (units)	<u>0.048</u>	10.04	<u> </u>	
	- J (<u>\</u>			
Sediment*:													
	0-10cm	n Samr	ale 1		0-100	m San	nnle 2		10-20cm	n Sample 1	16	0-20cm S	ample 2
		Weight				i Weig				Veight (g)		Total Wei	
Empty Container	Total	Weight	<u>. 141</u>		Total	rreig	111(19)		<u>Total (</u>	veight (g)	•	10141 1101	3111 137
Container and sample								_					
Sample								_					
Sample								-					
Total Volume (units)			٠.						2.092				
Total Volume (units)	1.981	<u> </u>	OL					-	2.0-112	11.12			
											_		
	Field D									n Marker		<u>loriz.Marl</u>	
	Total \	Weight	t (g)						Total \	Veight (g)		Total Wei	ight (g)
Empty Container													
Container and sample													
Sample													
											· -		
Total Volume (units)												_	
*Composited sample from 10 lo	cations: 3 le				ne, 4 loca	itions fr	om Cen	ter zone			ne.		
•			Same						Sange				
Comments: MA T	18 17	D	4	e G	•	27	τ.	Q	38.				
-tites 7	70	v	37)		()	<u> </u>	5	613				
<u> </u>)					>	-			
Signature:	•			_									

Page ____ of ____

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Destructive Sampling Field Sheet Porta-PSTA Cell Monitoring Portable Community Treatment Area (PSTA)

											Staff		
Porta-PSTA 3	5	10	12	14	17	(19)	20	21	22		Gaug	ge (in):	
	-					\cup						•	
Field Team:							_						
Date/Time:							_						
			-										
		Floa	ting/							Į	EndWall		
Periphyton:			hyton		<u>v</u>	<u>Vall</u>		Ber	<u>ıthic</u>	<u>Pe</u>	eriphyton		
Total Volume (units):		·0/25/			6.35	Vy 16.5	90 L	78.97	sky 175.	71L	(A)	$\widehat{\mathcal{D}}_{l}$	(0
OkSubsample il (units)		745	575	5	- 7	28		43	72	Inflow:	<u> </u>		_
Vol. DI added (mis		100	00		_ D	72		21	که		220	_ 320	21
Total Vol. Subsample		175	55		700	0		10	2	Outflows	pr: 3€	_ ^	-
ol Subsample 2 (units)		75	5		<u></u>	30		7	30)	12401		
Vol. Di added (mis		700	<u> </u>		2	OF.		2-	<u>of</u>	۷.>	,		
Total Vol. Subsample 2	2:	175	<u> </u>		10	Co		70	00	Out :	OF1	190	16
Field Duplicate:		FD2-	1002										<u>3</u>
		FD1.	5062										19
Macrophytes:		Above	Groun	ıd Por	tion (g)				Below	Ground Po	rtion (g)	
Plan wash	mpty		Cont	ainer					Empt	<u> </u>	Container		
	ntainer		and sa			San	nple		Contain	ner	and sample	- 9	Sample
Total Weight (Wet)	<u>-</u>		7			: ५	105	.	2		:10 ح. ما	_	4.8
	29		118		_	15	Joa.	- •	125	***************************************	134		1225
	25	_	120	,	_		3		V.		139		1233
Field Duplicates:	-)	_	12		-		MA				148	- :	28 · 18
BLEADER 10:121					_	777	65						1. 1.
Species Present		rcent		Sneci	les Pre		- 3	Per	cent	Snecia	es Present		Percen
	<u> </u>			орсо.	00 1 10	OCIII		<u> </u>	<u> </u>	<u>opoon</u>	30 1 1000.1.		, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Animals: Speci	<u>ies</u>	•	No.	Indivi	<u>duals</u>					<u>Tota</u>	l Weight (g)		
Fish Gunbuc	sig_			$b \perp$		_							
	spots			<u>a</u>		_	Empty						
5P#Z		pe		12		_			d sample				
Snails Halise	ma !	<u>.</u> .	<u></u>	51 D	-5	_	Sample	е				_	
·						_				~~ -			
Others							lotal v				sug 10.08	. L	
		_				_		/olum	e (unics)	0.013			
		<u> </u>						/olume	= (ums)	0.013	-		
Sediment*:	0.10	lom Sam	ania 1		0.10	om Can		/olume					nnie 2
		Ocm Sam				cm San	nple 2	/olume	10-20cm	n Sample 1	<u>10-2</u>	ocm San	
Sediment*:		Ocm San tal Weigl				cm San	nple 2	/olume	10-20cm		<u>10-2</u>		
Sediment*: Empty Container							nple 2	/olume	10-20cm	n Sample 1	<u>10-2</u>	ocm San	
Sediment*: Empty Container Container and sample							nple 2	/olume	10-20cm	n Sample 1	<u>10-2</u>	ocm San	
Sediment*: Empty Container Container and sample							nple 2	/olume	10-20cm	n Sample 1	<u>10-2</u>	ocm San	
Sediment*: Empty Container Container and sample Sample	Tot	tal Weigl	ht (g)				nple 2	/olum	10-20cm Total V	n Sample 1 Velght (g)	10-2 To	ocm San	
Sediment*: Empty Container Container and sample Sample	Tot		ht (g)				nple 2	/olum	10-20cm Total V	n Sample 1	10-2 To	ocm San	
Sediment*: Empty Container Container and sample Sample	<u>Tot</u>	al Weigi	ht (g)				nple 2	/olume	10-20cm Total V	n Sample 1 Veight (g)	10-2 To	cocm San	nt (g)
Sediment*: Empty Container Container and sample Sample	2.34:	al Weigl المراكبة d Dup Si	ht (g)				nple 2	/olume	10-20cm Total V	n Sample 1 Veight (g) در ۱۱،۷۵۷	10-2 To	cocm San tal Weigh	nt (g)
Sediment*: Empty Container Container and sample Sample Total Volume (units)	2.34 Field	al Weigl ایمر ا ۱۰۲ d Dup Sa tal Weigl	ample				nple 2	/olum	10-20cm Total V	n Sample 1 Veight (g)	10-2 To	cocm San	r Dup
Sediment*: Empty Container Container and sample Sample Total Volume (units)	2.34 Field	al Weigl المراكبة d Dup Si	ample				nple 2	/olum	10-20cm Total V	n Sample 1 Veight (g) در ۱۱،۷۵۷	10-2 To	cocm San tal Weigh	nt (g)
Sediment*: Empty Container Container and sample Sample Total Volume (units) Empty Container Container and sample	2.34 Field	al Weigl ایمر ا ۱۰۲ d Dup Sa tal Weigl	ample				nple 2	/olum	10-20cm Total V	n Sample 1 Veight (g) در ۱۱،۷۵۷	10-2 To	cocm San tal Weigh	nt (g)
Sediment*: Empty Container Container and sample Sample Total Volume (units) Empty Container Container and sample	2.34 Field	al Weigl ایمر ا ۱۰۲ d Dup Sa tal Weigl	ample				nple 2	/olum	10-20cm Total V	n Sample 1 Veight (g) در ۱۱،۷۵۷	10-2 To	cocm San tal Weigh	nt (g)
Sediment*: Empty Container Container and sample Sample Total Volume (units) Empty Container Container and sample Sample	2.34 Field	al Weigl ایمر ا ۱۰۲ d Dup Sa tal Weigl	ample				nple 2	/olum	10-20cm Total V	n Sample 1 Veight (g) در ۱۱،۷۵۷	10-2 To	cocm San tal Weigh	nt (g)
Sediment*: Empty Container Container and sample Sample Total Volume (units) Empty Container Container and sample Sample Total Volume (units)	Z.34	d Dup Sial Weigl	ample		Tot	al Welgi	nple 2 ht (q)		10-20cm Total V And Total V Horizon Total V	n Sample 1 Velght (g)	10-2 To	cocm San tal Weigh	nt (g)
Sediment*: Empty Container Container and sample Sample Total Volume (units) Empty Container Container and sample Sample Total Volume (units)	Z.34	d Dup Sal Weigl	ample ht (g)	dorth zo	Tot	al Welgi	nple 2 ht (q)		10-20cm Total V And Total V Horizon Total V	n Sample 1 Velght (g)	10-2 To	cocm San tal Weigh	nt (g)
Sediment*: Empty Container Container and sample Sample Total Volume (units) Empty Container Container and sample Sample Total Volume (units) Composited sample from 10 i	Field Tot	d Dup Sial Weight	ample ht (g)		Tot	al Welgi	nple 2 ht (q)	er zone,	10-20cm Total V And Total V Box And Total V	n Sample 1 Velght (g)	10-2 To	cocm San tal Weigh	nt (g)
Empty Container Container and sample Sample Total Volume (units) Empty Container Container and sample Sample Total Volume (units) Composited sample from 10 in the comments:	Field Tot	d Dup Sital Weight	ample ht (g)		Tot	al Weigi	om Cente	er zone,	Horizo	n Sample 1 Velght (g)	10-2 To	cocm San tal Weigh	nt (g)
Empty Container Container and sample Sample Total Volume (units) Empty Container Container and sample Sample Total Volume (units) Composited sample from 10 in the composited sample Comments:	Field Tot	d Dup Salal Weight	ample ht (g)		Tot	al Weigi	nple 2 ht (q)	er zone,	Horizo Total V	n Sample 1 Velght (g)	10-2 To	cocm San tal Weigh	nt (g)
Empty Container Container and sample Sample Total Volume (units) Empty Container Container and sample Sample Total Volume (units) Composited sample from 10 in the comments:	Field Tot	d Dup Sital Weight	ample ht (g)		Tot	al Weigi	om Cente	er zone,	Horizo	n Sample 1 Velght (g)	10-2 To	cocm San tal Weigh	nt (g)

Destructive Sampling Field Sheet Porta-PSTA Cell Monitoring Periphyton-Based Stormwater Treatment Area (PSTA) Project

		_											Staff	
Porta-PSTA	. 3	5	10	12	14	17	19	(20)	21	22			Gauge (in):	
Field Team:									•					
Date/Time:	2/12	- 01						_						
		'												
Dorinbudo			Floa									EndWa		Jol n.s
Periphyto Total Volum		, c	<u>Metap</u>				<u>/all</u>			<u>ithic</u>	4.51	Periphyt	ton	_
	nple:):(units):		1.501		<u>د</u> -	227/2		90	40°	<u> x </u>	82 ⊏ Infl	مه: کو مه: کو) 33
Vol. E	Ol added (mls):	•	22			38		_	700					
	. Subsample1:		100:			700		_	139		Outfl	ow:		
	nple 2 (units): Di added (mis):		32			<u> </u>		-	70					570
	Subsample 2:		100			100		-	134		ಶ್ಚ	557	ک 4 لوکم ک	2 //
Field Duplic	ate:						5012	-		· FDZ				
									50b Z	· FD1		·		· · · · · · · · · · · · · · · · · · ·
Macrophy		nnt.	Above			tion (g)				F			nd Portion (g)	
2405/024: 10.16		npty tainer		and s	<u>ainer</u> ample		Sa	mple		Emp Conta			tainer sample	Sample
Total Weig	ht (Wet) 4	3 165	;	13.5				3 <i>1b</i> s			<u> 24[0</u>		0 162	3.019
	mple 1: 12	9		815		_	49.		-	129		-85	5 109	المحر و
Wt. Subsa Field Dup	imple 2: 12	9		<u> </u>	5 —	-	44.	Š	-	<u>12 g</u>		55	25 147	4551
rieid Dup	incates.					-			-					
Species Pre	esent	Per	cent		Speci	es Pres	sent		Per	cent	Sp	ecies Pres	sent	Percent
Eliocha	ris	99						_				•		
Chara		1 4	%											
								-						
Animals:	Specie			No.	Indivi	duals		_				otal Weig	ıht (ġ)	
				No.	Indivi	duals		Empt	v Conta	iner		otal Weig	ıht (ġ)	
Animals:				No.	Indivi	duals	-	-	y Conta	iner id sampl		otal Weig	tht (g)	
Animals:		es		No.	Indivi	duals	-	-	iner an			otal Weig	tht (g)	
Animals: Fish Snails	Specie	s Savos		No.	Indivi	duals	-	Conta Samp	iner an le	d sampl	e			
Animals: Fish Snails Others	Specie Do live '49 160~100	es Salad		No.	Individ	duals	- - - -	Conta Samp	iner an le		e		ht (g)	
Animals: Fish Snails Others	Specie 10 live '41 1 Gangaria	es Salad		No.	Indivi	duals	-	Conta Samp	iner an le	d sampl	e			
Animals: Fish Snails Others	Specie 10 live '41 1 Gangaria	5 24.02 5 24.02 5 24.02 7 1.44	مر دm Sam	pple 1	Indivi	0-100		Conta Samp Total	iner an le	d sampl	e	03ª ks		mple 2
Animals: Fish Snails Others Local Sediment	Specie 10 live 14 160~1031 14 Drago-fl	5 24.02 5 24.02 5 24.02 7 1.44		pple 1	Individ	0-100	- - - - - - - Sar Nelg	Conta Samp Total	iner an le	e (units)	e	03 ° \ \<	, 10.04L	
Animals: Fish Snails Others Lu larvae Sediment Empty Cont	Specie 10 live 19 150~1001 1 Dragoft	5 24.02 5 24.02 5 24.02 7 1.44	مر دm Sam	pple 1	Individ	0-100		Conta Samp Total	iner an le	e (units)	e	03 ° \ \<	10-20cm Sa	
Animals: Fish Snails Others No Norvoa	Specie 10 live 19 150~1001 1 Dragoft	5 24.02 5 24.02 5 24.02 7 1.44	مر دm Sam	pple 1	Individ	0-100		Conta Samp Total	iner an le	e (units)	e	03 ° \ \<	10-20cm Sa	
Animals: Fish Snails Others Sediment Empty Cont Container at Sample	Specie 10 live 14 150~1051 14 Dragonfo	5 みのと 	به em Sam I Welgh	nple 1 nt (g)	Indivi	0-100		Conta Samp Total	iner an le	e (units)	e	03 ° \ \<	10-20cm Sa	
Snails Others Sediment Empty Cont	Specie 10 live 14 150~1051 14 Dragonfo	5 みのと 	مر دm Sam	nple 1 nt (g)	Individ	0-100		Conta Samp Total mple 2 (ht (g)	liner and	(units) 10-20c Total	m Sampl Weight (03 % \k< e 1 a)	10-20cm Sa	
Animals: Fish Snails Others Sediment Empty Cont Container at Sample	Specie 10 live 14 150~1051 14 Dragonfo	0-10c Tota	em Sam I Weigh	aple 1 nt (g)	Individ	0-100		Conta Samp Total mple 2 (ht (g)	liner and	10-20c Total	m Sampl Weight (03 % \k< e1 g) 	10-20cm Sa Total Welg	ht (g)
Animals: Fish Snails Others Sediment Empty Cont Container at Sample	Specie 10 live 14 150~1051 14 Dragonfo	0-10c Tota	em Sam I Weigh	aple 1 nt (g)	Individ	0-100		Conta Samp Total mple 2 (ht (g)	liner an le Volume - - - -	10-20c Total	m Sampl Weight (03 % \k< e 1 g) L.7 \	10-20cm Sa Total Weig	ht (g)
Animals: Fish Snails Others Varvoe Sediment Empty Cont Container at Sample Total Volum Empty Cont	Specie Specie Do live '49 Go ~ 305) Do co 306 A Do c	0-10c Tota	em Sam I Weigh	aple 1 nt (g)	Indivi	0-100		Conta Samp Total mple 2 (ht (g)	liner an le Volume - - - -	10-20c Total	m Sampl Weight (03 % \k< e 1 g) L.7 \	10-20cm Sa Total Welg	ht (g)
Animals: Fish Snails Others Sediment Empty Cont Container at Sample Total Volum Empty Cont Container at	Specie Specie Do live '49 Go ~ 305) Do co 306 A Do c	0-10c Tota	em Sam I Weigh	aple 1 nt (g)	Individ	0-100		Conta Samp Total mple 2 (ht (g)	liner an le Volume - - - -	10-20c Total	m Sampl Weight (03 % \k< e 1 g) L.7 \	10-20cm Sa Total Weig	ht (g)
Animals: Fish Snails Others Varvoe Sediment Empty Cont Container at Sample Total Volum Empty Cont	Specie Specie Do live '49 Go ~ 305) Do co 306 A Do c	0-10c Tota	em Sam I Weigh	aple 1 nt (g)	Individ	0-100		Conta Samp Total mple 2 (ht (g)	liner an le Volume - - - -	10-20c Total	m Sampl Weight (03 % \k< e 1 g) L.7 \	10-20cm Sa Total Weig	ht (g)
Animals: Fish Snails Others Sediment Empty Cont Container at Sample Total Volum Empty Cont Container at Sample	Specie Specie Live 4	0-10c Tota	em Sam I Weigh	aple 1 nt (g)	Indivi	0-100		Conta Samp Total mple 2 (ht (g)	liner an le Volume - - - -	10-20c Total	m Sampl Weight (03 % \k< e 1 g) L.7 \	10-20cm Sa Total Weig	ht (g)
Animals: Fish Snails Others Sediment Empty Cont Container as Sample Total Volum Empty Cont Container as	Specie Specie Live 4	O-10c Tota	Em Sam I Weigh	aple 1 nt (g) ample nt (q)		O-100 Tota	al Welg	Total mple 2 tht (g)	Volume	10-20c Total Horiz Total	m Sample Weight (e 1 g) 	10-20cm Sa Total Weig	ht (g)
Animals: Fish Snails Others Sediment Empty Cont Container at Sample Total Volum Container at Sample Total Volum Container at Contai	Specie O-10c Tota L4.11v	Em Sam I Weigh	aple 1 at (g) ample at (g)	forth zo	O-100 Tota	al Welg	Total mple 2 tht (g)	Volume	10-20c Total Horiz Total	m Sample Weight (e 1 g)	10-20cm Sar Total Weig	er Dup	
Animals: Fish Snails Others Sediment Empty Cont Container as Sample Total Volum Empty Cont Container as	Specie O-10ce Tota Light No.	Dup Sall Weight	aple 1 at (g) ample at (g)	forth zo	O-100 Tota	al Welg	Total mple 2 tht (g)	Volume	10-20c Total Horiz Total	m Sample Weight (e 1 g) 	10-20cm Sar Total Weig	ht (g)	

P=14e010 PSTA/Field/Fieldsheets/PP Fueldsheets/Destructive

Destructive Sampling Field Sheet Porta-PSTA Cell Monitoring Periphyton-Based Stormwater Treatment Area (PSTA) Project

						148010.F	P2.06.C	н				
Porta-PSTA 3	5	10	12	14	17	19	20	®	22		Staff Gauge (in):	
Field Team: Date/Time: 2/12	01						•					
Davidada da arri	s): e1:)]] s):	Metap	0	Albs	3,6 64. 355 100	g AL	.3 L	16./ 300 100 300	0 S S	Inflow: 60 Unflow: 500 Outflow: 437	_	00 410 503 73 Me 427 DI 503 TO
•	Empty ontainer	Above	Cont	nd Port ainer ample	ion (a)	SMMPU BULLET	4+B. T1.7 nple	eker.	CAN 6 Empty Contain	Below Grour Cont	nd Portion (g) ainer ample	<u>Sample</u>
Species Present	<u>Per</u>	cent		Specie	es Pres	<u>ent</u>		Per	cent	Species Pres	<u>ent</u>	Percent
Others Draw	isona Elm pulle	eg g mys		Individ	luals	7	Conta Samp	le	iner d sample (units)	Total Weight 14 163 144 400,00	displace	vol yord ant 250 750 M2C 15yl ad vol
Empty Container Container and sample Sample		em Sam al Weigt				m Sam I Weigl		- -	10-20cm Total W	Sample 1 eight (g)	10-20cm Sa Total Weld	
Total Volume (units)				•				-				
Empty Container Container and sample Sample		Dup Sa Il Weigh								n Marker /eight (g)	Horiz.Mark Total Weig	
Total Volume (units) *Composited sample from 10	locations:	3 location	s from f	North zo:	ne, 4 loca	ations fro	om Cen	ter zone,	3 locations f	rom South zone.		
Comments:									44			
Signature:												

P \146010 PSTA\Field\Field\FredStructive

Destructive Sampling Field Sheet Porta-PSTA Cell Monitoring Periphyton-Based Stormwater Treatment Area (PSTA) Project

						148010.F	2.06.CF	1				
										Staff		
Porta-PSTA 3	5	10	12	14	17	19	20	21	22	Gaug	ge (in):	
Field Team:												
Date/Time: 2 12	01											
1.1.		Float	ting/	24	2402.		<3.	98 kg		.₄∖ EndWall		
	,45 hz	Metap			m r _	Vall	57.9	Ber	nthic	EndWall Periphyton	(5)	(Z
Total Volume (units):			_+60C	ml	70			B	5-155n	" OA _	B	3
Vol. Subsample 1 (units)			<u>pml</u>		<u>23</u>				ml 595	Inflow: X000 95	- 67 - 1:3:	NO
Vol. Di added (mis Total Vol. Subsamplet	-	107:			72	20	•	100	52	Outflow: 50		50
Vol. Subsample 2 (units)					-\ <u>\</u> 3	<u> </u>	•		m 655		<u> </u>	
Vol. DI added (mis):	411				₹ 0			12		128	130
Total Vol. Subsample 2	2:	100	<u>ാ</u>			62		عمد	00	280 277: 125	372	37
Field Duplicate: CAN WI (8/165	CANASA	WAL-165	4 163	•	-20.	2-(2-61 4-2//C) 24)45	10/13	5 lbs	cos	$\omega_{\mathcal{C}}$	SU
Macrophytes:	CWTO		Groun						3 103	Below Ground Po	rtion (a)	
	mpty	<u> </u>	Cont			_			Empt			
	ntainer		and sa			San	nple		Contai	ner and sampl	<u>e</u> 9	Sample
Total Weight (Wet)					_			-		· · · · · · · · · · · · · · · · · · ·		
Wt. Subsample 1: Wt. Subsample 2:					-			-				
Field Duplicates:		- •			-			-				
					-	-		-				
Species Present	<u>Per</u>	rcent		<u>Speci</u>	es Pre	sent		Per	cent	Species Present	9	Percent
							•					
Animals: Speci	ies		No.	Indivi	duals					Total Weight (g)	VI	ويبادين
Fish			23.22							11		
								y Conta		170	_ '42.	Smill He
Spalls 11-00-	ion	- 6	92	(12-	-216	<u> </u>	Conta		nd sample	* 159 0	_ +?57	mil Hac
Snails H-W19	·	er :	+	7	علک	100	Samp	16		0	— , ,	
Others Water	bug	_		Z	•	-WE	Total	Volum	e (units)	375 ml	Miked	
drage	~ H = 1	Ayu.		1								
Sediment*:	<i>y</i>	U							•			- 0
		cm San				on San					20cm Sample Stal Weight (
Empty Container	100	al Weigl	nt (g)		101	al Weig	nt (g)		Iolai	Weight (g)	nai Weight	11
Container and sample				•				-				
Sample								-				
Total Maluma (umita)												
Total Volume (units)			·····	•				-				
	Field	d Dup Sa	ample						Horize	on Mar <u>ker</u> <u>Ho</u>	riz.Marker D	up
		al Weigi							Total '	Weight (g) To	otal Weight (a)
Empty Container												
Container and sample												
Sample				•								
Total Volume (units)												
*Composited sample from 10	locations:	3 location	ns from I	North z	one, 4 lo	cations fr	om Cen	ter zone	, 3 locations	from South zone.		
Commerte												
Clamations												
P 1:48010 PSTAVField\Field\2(s\2)	P Fieldsheets	Destructive			Pa	ge	_ of _				£ 4.	rv 013101fb



Destructive Sampling Field Sheet Porta-PSTA Monitoring

Periphyton-Based Stormwater Treatment Area (PSTA) Project

148010.P2.06.CH

her Conditions:	7 1-	2 0.		(See page 1 uni	less otherwise noted)
Date:		1-01			
Porta-PSTA Tank No.	Staff Gauge Reading	Water Depth Inflow	Water Depth Outflow	Accretion abov Upstream	e Horizon Marke Downstrear
1					
2					
3	133/16	1,87	1.66		
4		7			
5	_13	1.95	1.66		
6					
7					
8	<u> - i</u>				<u> </u>
9					
10	125/8	1.65	1,69		
11	-				
12	113/4	1,58	1.65		
13					
14		1.75	1.68		
15					
16		•			
17	127/16	1.86	1.69		
18	10 61				•
19	13 1/16	1.89	1,50		
20	10 1/4	1.62	1.41		
21	3 1/16	1.04	1.01		
22	5/16	1. 10	1.02		
23		1.77	1.77		
24		+.76	1.76		
Comments:					

Rev013101F8

FEBRUARY 12, 2001 PSTA DESTRUCTIVE SAMPLING EVENT - MAC

CH2M HILL Chain of Custody Form

PSTA

equest ID:	PPB	
Kit Requ	Lab:	
ORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR KIT Request ID:	Ellen Patterson / USA 954.426.6112 x233	
Project: HYTON-BASED STORMWATER TREA	Laboratory Coordinator:	_
Project: H	148010.01.05.CH	
P256	1480	
COC Number:	Project #:	

		Comments																				
		Analysis Requested	AFDW, Ca++, DWght																			
	Number of	Containers	1	-		-	1	1	1	1	-	-	1	1	-	-	1	1	-	1		
J		Matrix	MC	S M	WC WC	Ş	WC WC	S M	WC	Ş	æ	WC WC	MC	MC	æ	æ	MC	WC	ξ	MC		
	Time	ted	1233	1733	4041	1405	1591	(S)	5580	55,0	्रका	0201	25 21	1881	0350	3,55	026	CS (T	2000	1233		
	Date & Time	Collected	10/170	02761	10/150	100180	104/40	10/180	19/20	02/50	12/60	15/140	102 (50)	10570	105/20	104/4CI	105/20	156120	154140	02/401	-	
		Station ID	PP-3-MAC	PP-3-MAC	PP-5-MAC	PP-5-MAC	PP-10-MAC	PP-10-MAC	PP-12-MAC	PP-12-MAC	PP-14-MAC	PP-14-MAC	PP-17-MAC	PP-17-MAC	PP-19-MAC	PP-19-MAC	PP-20-MAC	PP-20-MAC	PP-FD1-MAC	PP-FD2-MAC		
		Sample ID	PP-3-MAC1	PP-3-MAC2	PP-5-MAC1	PP-5-MAC2	PP-10-MAC1	PP-10-MAC2	PP-12-MAC1	PP-12-MAC2	PP-14-MAC1	PP-14-MAC2	PP-17-MAC1	PP-17-MAC2	PP-19-MAC1	PP-19-MAC2	PP-20-MAC1	PP-20-MAC2	PP-FD1-MAC	PP-FD2-MAC		

Sampled By:	Date / Time:		Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:	
Shipped Via:	UPS FedEx Hand Other (please specify):					
Received By:	Date / Time:	Cooler Temp:	Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:	
Received By:	Date / Time:	Cooler Temp:	Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:	
Remarks:			·			

Generated on: 02/02/2001 4:42:29 PM

FEBRUARY 12, 2001 PSTA DESTRUCTIVE SAMPLING EVENT - RTS

	PPB	
Kit Request ID:	Lab:	
HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR KIT Request ID:	Laboratory Coordinator: Ellen Patterson / USA 954.426.6112 x233	
P258 Project:	148010.01.05.CH	
COC Number:	Project #:	

				į		The second secon	
		Date & Time	Time		Number of		
Sample ID	Station ID	Collected	ted	Matrix	Containers	Analysis Requested	Comments
PP-3-RTS1	PP-3-RTS	(कार्ट0	(50)	MC	1	AFDW, Ca++, DWght	
PP-3-RTS2	PP-3-RTS	_	1233	æ	4	AFDW, Ca++, DWght	
PP-5-RTS1	PP-5-RTS		1412	WC W	1	AFDW, Ca++, DWght	
PP-5-RTS2	PP-5-RTS		1415	S R	1	AFDW, Ca++, DWght	
PP-10-RTS1	PP-10-RTS		<u>7</u>	WC	7	AFDW, Ca++, DWght	
PP-10-RTS2	PP-10-RTS	۶	200	WC	-	AFDW, Ca++, DWght	
PP-12-RTS1	PP-12-RTS	102/40	00/00	MC	-	AFDW, Ca++, DWght	
PP-12-RTS2	PP-12-RTS	-	090	MC	1	AFDW, Ca++, DWght	
PP-14-RTS1	PP-14-RTS		0501	WC	-	AFDW, Ca++, DWght	
PP-14-RTS2	PP-14-RTS		R.	S	1	AFDW, Ca++, DWght	
PP-17-RTS1	PP-17-RTS		3,8	Ω	1	AFDW, Ca++, DWght	
PP-17-RTS2	PP-17-RTS	4	84.	S S	1	AFDW, Ca++, DWght	
PP-19-RTS1	PP-19-RTS	104/80	5005	S R	-	AFDW, Ca++, DWght	
PP-19-RTS2	PP-19-RTS	ر مهري	0)60	MC	ļ	AFDW, Ca++, DWght	
PP-20-RTS1	PP-20-RTS	1021201	1155	MC	1	AFDW, Ca++, DWght	
PP-20-RTS2	PP-20-RTS	10,7120	1155	MC	1	AFDW, Ca++, DWght	
PP-FD1-RTS	PP-FD1-RTS	├	3160	MC	1	AFDW, Ca++, DWght	
PP-FD2-RTS	PP-FD2-RTS	03/43/	1233	MC	-	AFDW, Ca++, DWght	
		-					

Sampled By:	Date / Time:		Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:
Shipped Via:	UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	Cooler Temp:	Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:
Remarks:					

FEBRUARY 12, 2001 DESTRUCTIVE SAMPLING EVENT - UPR

Date & Time	1	Col	nator:	ELLEII FACCELSOII / USA 304:120:0112		Lab:
Date & Time Containers Analysis Requested Collected Distrix Containers Analysis Requested Collected Distrix Containers Psocilios, BD, Ca++ Collected District Distr	Date / Time Contented Matrix Containers Anniyasis Requested Collected Collec	Date & Tir Collecte				
Date / Time; Dat	20 20 10 10 10 10 10 10	10/11/20			sted	Comments
1981/8 PP 2 PSOLIDS, BD, Ca++ 1940 PP 2 PSOLIDS, BD,	194 9	272		PSOLIDS, BD, Ca++		
1040 PP 2 PSOLIDS, BD, Ca++ 1043 PP 2 PSOLIDS, BD, Ca++ 1535 PP 2 PSOLIDS, BD, Ca++ 1546 PP 2 PSOLIDS, BD, Ca++ 1546 PP 2 PSOLIDS, BD, Ca++ 1546 PP 2 PSOLIDS, BD, Ca++ 1547 PP PSOLIDS, BD, Ca++ 1547 PP PSOLIDS, BD, Ca++ 1547 PP PSOLIDS, BD, Ca++ 1547 PSOLID	1040 PP 2 PSOLIDS, BID, Ca++ 1535 PP 2 PSOLIDS, BID, Ca++ 1535 PP 2 PSOLIDS, BID, Ca++ 1546 PP 2 PSOLIDS, BID, Ca++ 1547 PP 2 PSOLIDS, BID, Ca++ 1548 PP 2 PSOLIDS, BID, Ca++ 1549 PP 2 PSOLIDS, BID, Ca++ 1549 PP 2 PSOLIDS, BID, Ca++ 1540 PSOLIDS, BID, C			PSOLIDS, BD, Ca++		
1042 PP 2 PSOLIDS, BD, Ca++ 1545 PP 2 PSOLIDS, BD, Ca++ 1546 PP 2 PSOLIDS, BD, Ca++ 1546 PP 2 PSOLIDS, BD, Ca++ 1547 PP 2 PSOLIDS, BD, Ca++ 1547 PP 2 PSOLIDS, BD, Ca++ 1547 PP 2 PSOLIDS, BD, Ca++ 1548 PP 2 PSOLIDS, BD, Ca++ 1549 PP 2 PSOLIDS, BD, Ca++ 1540 PP 3 PSOLIDS, BD, Ca++ 1540 PSOLIDS, BD, Ca++	1043 PP 2 PSOLIDS, BD, Cast- 1535 PP 2 PSOLIDS, BD, Cast- 1535 PP 2 PSOLIDS, BD, Cast- 1445 PP 2 PSOLIDS, BD, Cast- 1445 PP 2 PSOLIDS, BD, Cast- 1455 PP 2 PSOLIDS, BD, Cast- 1500 PP			PSOLIDS, BD, Ca++		
1532 PP 2 PSOLIDS, BD, Ca++	1530 PP 2 PSOLIDS, BD, Ca++ F345 PP 2 PSOLIDS, BD, Ca++ 7445 PP 2 PSOLIDS, BD, Ca++ 7445 PP 2 PSOLIDS, BD, Ca++ 7445 PP 2 PSOLIDS, BD, Ca++ F345 PP 2 PSOLIDS, BD, Ca++ F355 PSOLIDS, BD, Ca++ PSOLI			PSOLIDS, BD, Ca++		
1545 PP 2 PSOLIDS, BD, Ca++ 1746 PP 2 PSOLIDS, BD, Ca++ 1747 PP 2 PSOLIDS, BD, Ca++ 1757 PSOLIDS,	15440 PP 2 PSOLIDS, BD, Ca++ PSOLIDS, BD, C			PSOLIDS, BD, Ca++		
1	1-4/6 PP 2 PSOLIDS, BD, Ca++ 1-4/6 PP 2 PSOLIDS, BD, Ca++ 1-4/5 PSOLIDS, BD, Ca++ PSOLIDS, BD, Ca++ 1-4/5 PSOLIDS, BD, Ca++ PSOLIDS, BD,			PSOLIDS, BD, Ca++	•	
1	PP 2 PSOLIDS, BD, Ca++ PP 2 PSOLIDS, BD, Ca++ PSOLIDS, BD, Ca++ PP 2 PSOLIDS, BD, Ca++ PSOLIDS, BD, Ca++ PP 2 PSOLIDS, BD, Ca++ PSOLIDS,			PSOLIDS, BD, Ca++		
Date / Time; Sole PP 2 PSOLIDS, BD, Ca++ 1435 PP 2 PSOLIDS, BD, Ca++ 1435 PP 2 PSOLIDS, BD, Ca++ 1435 PP 2 PSOLIDS, BD, Ca++ 1405 PSOLIDS, BD, Ca++ 1405	Φλίζοι 5/2 PP 2 PSOLIDS, BD, Ca++ Φλίζοι 1473 PP 2 PSOLIDS, BD, Ca++ Φλίζοι 1473 PP 2 PSOLIDS, BD, Ca++ Φλίζοι WQ 1 Ca++ Πρίζοι WQ 1 Ca++ Φ 1 V N Relinquished By: Date / Time: Cooler Temp: Custody Seal: Y / N Relinquished By:	>		PSOLIDS, BD, Ca++		
1	15/4 PP 2 PSOLIDS, BD, Ca++ 1425 PP 2 PSOLIDS, BD, Ca++ 1434 PP 2 PSOLIDS, BD, Ca++ 15/5 PP 2 PSOLIDS, BD, Ca++ 16/50 PP	105120		PSOLIDS, BD, Ca++		
1435 PP 2 PSOLIDS, BD, Ca++ PSOLIDS,	1434 PP 2 PSOLIDS, BD, Ca++ PSOLIDS, BD, Ca+			PSOLIDS, BD, Ca++		
1	1			PSOLIDS, BD, Ca++		
1	1	PP-17-UPR & 1437		PSOLIDS, BD, Ca++		
1400 PP 2 PSOLIDS, BD, Ca++ 1030 PP 2 PSOLIDS, BD, Ca++ 1034 PSOLIDS, BD, Ca++	1400 PP 2 PSOLIDS, BD, Ca++ 1030	_		PSOLIDS, BD, Ca++		
1030 PP 2 PSOLIDS, BD, Ca++ 1035 PP 2 PSOLIDS, BD, Ca++ 1035 PP 2 PSOLIDS, BD, Ca++ 155 WQ 1 Ca++ 156 WQ 1 Ca++ 15	1030 PP 2 PSOLIDS, BD, Ca++ PSOLIDS, BD, Ca++ PP 2 PSOLIDS, BD, Ca++ PSOLIDS, BD, CA+			PSOLIDS, BD, Ca++		
1 075	Cooler Temp: Cool	PP-20-UPR / 15/30		PSOLIDS, BD, Ca++		
() 1 () 2 () () 2 () () () () () ()	1	PP-20-UPR 1035		PSOLIDS, BD, Ca++	•	
1	5 40 50 50 50 50 50 50	PP-FD1-UPR & 1407	dd	PSOLIDS, BD, Ca++		
	Date / Time: Date / Time: Date / Time: Date / Time: Cooler Temp: Custody Seal: Y / N Relinquished By:	71401	ЬР	PSOLIDS, BD, Ca++		
	Date / Time: Custody Seal: Y / N Relinquished By:			Ca++		
Date / Time: Custody Seal: Y / N Relinquished By: Custody Seal: Y / N Relinquished By: Date / Time: Custody Seal: Y / N Relinquished By:	Date / Time: Date / Time: Hand Other (please specify): Date / Time: Date / Time: Custody Seal: Y / N Relinquished By: Date / Time: Custody Seal: Y / N Relinquished By:	7	WQ	Ca++		
Date / Time: Custody Seal: Y / N Relinquished By: Hand Other (please specify): Date / Time: Custody Seal: Y / N Relinquished By: Custody Seal: Y / N Relinquished By:	Date / Time: Hand Other (please specify): Date / Time: Date / Time: Custody Seal: Y / N Relinquished By: Date / Time: Custody Seal: Y / N Relinquished By:	ď				
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FEBRUARY 12, 2001 DESTRUCTIVE SAMPLING EVENT - WP

CH2M HILL Chain of Custody Form PSTA

COC Number:	P247	Project: H	Project: HYTON-BASED STORMWATER TRE	D STORWWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR Kit Request ID:	it Request ID:	
Project #:	148010.(148010.01.05.CH	Laboratory Coordinator:	tory Coordinator: Ellen Patterson / USA 954.426.6112 x233	ab:	PPB
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	Comments																								
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	Sample ID	PP-3-WP1	PP-3-WP2	PP-5-WP1	PP-5-WP2	PP-10-WP1	PP-10-WP2	PP-12-WP1	PP-12-WP2	PP-14-WP1	PP-14-WP2	PP-17-WP1	PP-17-WP2	PP-19-WP1	PP-19-WP2	PP-20-WP1	PP-20-WP2	PP-21-WP1	PP-21-WP2	PP-22-WP1	PP-22-WP2	PP-FD1-WP	PP-FD2-WP	PP-EB1-WP	PP-EB2-WP

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Remarks:

FEBRUARY 12, 2001 DESTRUCTIVE SAMPLING EVENT - BP

Chain of Custody Form CH2M HILL

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Kitr	Lab:								1			!	j		4	!
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P247 Pr	148010.01.05.CH		Station ID	PP-3-BP	PP-3-BP	PP-5-BP	PP-5-8P	PP-10-BP	PP-10-BP	98 63 BB	00 11 BP	PP-14-BP	PP-14-BP	PP-17-BP	PP-17-BP	PP-19-BP
COC Number:	Project #:		Sample ID	PP-3-BP1	PP-3-BP2	PP-5-BP1	PP-5-BP2	PP-10-BP1	PP-10-BP2	YOU STAN	Cad et ad	PP-14-BP1	PP-14-BP2	PP-17-8P1	PP-17-BP2	PP-19-BP1

PP-EB2-BP PP-EB2-BP Oglet / Time: WQ 1 AFDW, Ca++, DWght Sampled By: Date / Time: Custody Seal: Y / N Relinquished By: Date / Time: Received By: Date / Time: Cooler Temp: Custody Seal: Y / N Relinquished By: Date / Time: Remarks: Remarks: Remarks: AFDW, Ca++, DWght Custody Seal: Y / N Relinquished By: Date / Time:			2	1						
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FEBRUARY 12, 2001 PSTA DESTRUCTIVE SAMPLING EVENT - CON

CH2M HILL Chain of Custody Form

PSTA

Project: HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR KIT Request ID: Lab: Project #: 148010.01.05.CH Laboratory Coordinator: Ellen Patterson / USA 954.426.6112 x233 P260 COC Number:

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		Date & Time	Time		Number of		
Sample ID	Station ID	Collected	ted	Matrix	Containers	Analysis Requested	Comments
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PP-10-CON	PP-10-CON	_	7447	ㅂ	-	AFDW, Ca++, DWght	
PP-12-CON	PP-12-CON		1510	FT	1	AFDW, Ca++, DWght	
PP-14-CON	PP-14-CON		1525	Ħ	-	AFDW, Ca++, DWght	
PP-17-CON	PP-17-CON		047	Ħ	-	AFDW, Ca++, DWght	
PP-19-CON	PP-19-CON		(300	Ħ	1	AFDW, Ca++, DWght	
PP-20-CON	PP-20-CON	>	13/2	FT	1	AFDW, Ca++, DWght	
PP-21-CON	PP-21-CON	105150	1635	FI	1	AFDW, Ca++, DWght	
PP-22-CON	PP-22-CON	1	1635	FT	1	AFDW, Ca++, DWght	
PP-FD1-CON	PP-FD1-CON	*	1/2/	FT	1	AFDW, Ca++, DWght	
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Remarks:					

FEBRUARY 12, 2001 DESTRUCTIVE SAMPLING EVENT - FP

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Project: HYTON-BASED STORMW	Laboratory Coordinator:	Date & Time Collected	1356	1350	1540	1545	0101	7101			0925	0630	1100	11.05	08/30	4590	1850	ككما	150	1515	FEH	385	P5190	0935	8	८०)	Date / Time:	Other (please specify):	Date / Time:	Date / Time:	
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FEBRUARY 12, 2001 PSTA DESTRUCTIVE SAMPLING EVENT - IP

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Project: HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR Kit Request ID:	r: Ellen Patterson / USA 954.426.6112 x233	
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P250	148010.01.05.CH	
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Remarks:					

FEBRUARY 12, 2001 DESTRUCTIVE SAMPLING EVENT - FP

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Remarks:					

FEBRUARY 12, 2001 PSTA DESTRUCTIVE SAMPLING EVENT - BP

Project: HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR KIT Request ID:	.05.CH Laboratory Coordinator: Ellen Patterson / USA 954.426.6112 x233 Lab:	Date & Time Number of Oollected Matrix Containers Analysis Requested Comments	CIPO MID S	(04/2	०५१० ५	0380	\$ U2(1)c) \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			CSHI J		7	\$ 62120 HIS	
ject: HYTON-BASED STOR		Date & Time Collected						CE 9/1	CCHI	CSHI	2 2	C3 1		ンガー
P249	148010.01.05.CH	Station ID	17.08.3 (B) (T)	17.08.C DAITO	15.00.1 B	19.08.6	20.08.8 021701	20.08	\$1.00.VC	21.03.0	# 22.00PG	J. 80.46	5 37.66 de	22.18.0
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FEBRUARY 12, 2001 DESTRUCTIVE SAMPLING EVENT - LWR

Kit Request ID:	Lab:	Comments																						
Project: HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Ellen Patterson / USA 954.426.6112 x233	er of Analysis Requested	CA S, PSOLIDS	CA_S, PSOLIDS, BD	CA_S, PSOLIDS, BD	CA_S, PSOLIDS, BD	CA_S, PSOLIDS, BD	CA_S, PSOLIDS, BD	CA_S, PSOLIDS, BD	CA_S, PSOLIDS, BD	CA_S, PSOLIDS, BD	CA_S, PSOLIDS, BD	CA_S, PSOLIDS, BD	CA_S, PSOLIDS, BD	CA_S, PSOLIDS, BD	CA_S, PSOLIDS, BD	CA_S, PSOLIDS, BD	CA_S, PSOLIDS, BD	CA_S, PSOLIDS, BD	CA_S, PSOLIDS, BD	Ca++	Ca++	CA_S, PSOLIDS, BD	
ER TREATMENT		Number of Matrix Containers			PP 2	Wa 1	wa 1	pp 2																
YTON-BASED STORMWAT	Laboratory Coordinator:	Date & Time	GC%\\	7,080	2401	4,90	(CHO	INT	C&F.)	74.47			CAN.	シカカリ			CFO!	9401	487		1/24	_	4751	
Project: H	05.СН		CHICA	T					-	>	6/60	1	-	7	(50)		_	_	7	R 021401	1	8	7	
P247	148010.01.05.CH	Ctation ID	PP-3-LWR	PP-3-LWR	PP-5-LWR	PP-6-LWR	PP-10-LWR	PP-10-LWR	PP-12-LWR	PP-12-LWR	PP-14-LWR	PP-14-LWR	PP-17-LWR	PP-17-LWR	PP-19-LWR	PP-19-LWR	PP-20-LWR	PP-20-LWR	PP-FD1-LWR	PP-FD2-LWR	PP-EB1-LWR	PP-EB2-LWR	PP-FD3-LWR	
COC Number:	Project #:	Ol olome S	PP-3-LWR1	PP-3-LWR2	PP-6-LWR1	PP-6-LWR2	PP-10-LWR1	PP-10-LWR2	PP-12-LWR1	PP-12-LWR2	PP-14-LWR1	PP-14-LWR2	PP-17-LWR1	PP-17-LWR2	PP-19-LWR1	PP-19-LWR2	PP-20-LWR1	PP-20-LWR2	PP-FD1-LWR	PP-FD2-LWR	PP-EB1-LWR	PP-EB2-LWR	PP-FD3-LWR	

Sampled By:	Date / Time:		Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:
Shipped Via:	UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	Cooler Temp:	Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:
Remarks:					
,					

FEBRUARY 12, 2001 PSTA DESTRUCTIVE SAMPLING EVENT - LWR

COC Number:	P252	Project: H	Project: HYTON-BASED STORMWATER TRE	DRWWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR Kit Request ID:	Kit Request ID:	:
Project #:	148010.0	148010.01.05.CH	Laboratory Coordinator:	Ellen Patterson / USA 954.426.6112 x233	Lab:	IFAS
1						

		Date	Date & Time		Number of			
Sample ID	Station ID	Coll	Collected	Matrix	Containers		Analysis Requested	Comments
P2-0693	PP-3-LWR	०५।८०	583	SD	-	TIP_SE, TP	-	
P2-0694	PP-3-LWR	_	0878	SD	-	TP_S		
P2-0695	PP-5-LWR		1047	SD	-	TIP_SE, TP		
P2-0696	PP-5-LWR		7401	SD	1	TP_S		
P2-0697	PP-10-LWR	_	2421	SD	1	TIP_SE, TP		
P2-0698	PP-10-LWR		0451	SD	-	TP_S		
P2-0699	PP-12-LWR		7541	S.	1	TIP_SE, TP		
P2-0700	PP-12-LWR	7	C£+\	SD	-	TP_S		
P2-0701	PP-14-LWR	(क्रांस्ट्र)	>251	SD	-	TIP_SE, TP		
P2-0702	PP-14-LWR	_	८५ ८/	SD	1	TP_S		
P2-0703	PP-17-LWR	_	7441	SD	-	TIP_SE, TP		
P2-0704	PP-17-LWR	7	0441	SD	-	TP_S		
P2-0705	PP-19-LWR	(क्र) हुं	0141	SD	-	TIP_SE, TP		
P2-0706	PP-19-LWR	_	1408	SD	-	TP_S		
P2-0707	PP-20-LWR		1401	SD	-	TIP_SE, TP		
P2-0708	PP-20-LWR		0401	SD	1	TP_S		
P2-0709	PP-FD1-LWR	→	FH01	SD	-	TIP_SE, TP		
P2-0710	PP-FD2-LWR O21431	104160	CADK	SD	1	TP_S		
P2-0711	PP-FD3-LWR	1	4421	SD	1	TP_S		
P2-0712	PP-EB1-LWR		4511	WQ	1	TIP_SE, TP		
P2-0713	PP-EB2-LWR	7	811	WQ	1	TP_S		

Sampled By:	Date / Time:		Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:
Shipped Via: U	Shipped Via: UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	Cooler Temp:	Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:
Remarks:					

FEBRUARY 12, 2001 PSTA DESTRUCTIVE SAMPLING EVENT - FP

COC Number:	P241 Pre	olect: HYTO	N-BASED STORWW	ATER TRE	ATMENT AREA	Project: HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR		Kit Request ID:	
Project #:	148010.01.05.CH	5.СН	Laboratory Coordinator:	rdinator:	Ellen 1	Ellen Patterson / USA 954.426.6112 x233		Lab:	IFAS
Sample ID	Station ID	Dat	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	hested		Comments
P2-0600		156160	1350	dd	-	TIP P, TP P			
P2-0601		_	1356	рр	1	тр р			
P2-0602	PP-5-FP	_	1543	dd	-	<u>тр р, тр р</u>			
P2-0603	PP-5-FP	7	1540	рр	-	TP_P			
P2-0604	PP-10-FP	(0)/40)	1012	ЬР	-	тр р, тр р			
P2-0605	PP-10-FP	(८५/८०	0101	ф	-	тр р			
		J				THE P. TP. P.			
		l				• en en			
P2-0608	PP-14-FP	021501	0930	ЬР	-	TIP P, TP P			
P2-0609	PP-14-FP	_	50,00	ЬР	-	тр р			
P2-0810	PP-17-FP	_	201100	dd .	1	TIP P, TP P			
P2-0611	PP-17-FP	>	0017	dd	-	тр р			
P2-0612	PP-19-FP	125,50	4540	ЬР	-	TIP_P, TP_P			
P2-0613	PP-19-FP	197.00	0670	ЬÞ	-	TP_P			
P2-0614	PP-20-FP	53120	1655	ЬР	•	тр р, тр р			
P2-0615	PP-20-FP	_	1,530	ЬР	*	тр р			
P2-0616	PP-21-FP		1515	ЬР	,-	тр р, тр р			
P2-0617	PP-21-FP		1510	dd	-	ТР Р			
P2-0618	PP-22-FP	_>	1500	Ьр	-	тр р, тр р			
P2-0619	PP-22-FP	>	١٩٤٢	ЬÞ	-	тр Р			
P2-0620	PP-F01-FP	02 133		dd	1	тр р, тр р			
P2-0621	PP-FD2-FP	102180		dd	-	ТР Р			
P2-0622	PP-EB1-FP	124/40	1051	δ	-	тр р, тр р			
P2-0623	PP-EB2-FP	०५१८०	1001	W	-	тр р			
Cempled By:		Date	Date / Time:			Custody Seal: Y / N	Relinquished By:		Date / Time:
Orleast Vis.	LIDS EAST	Hand Other	Other (please enecity):						
Shipped via:	Legger		picase speeny/						i
Received By:		Dat	Date / Time:	Coo	Cooler Temp:	Custody Seal: Y / N	Relinquished By:		Date / Time:
Received By:		Dat	Date / Time:	Cook	Cooler Temp:	Custody Seal: Y / N	Relinquished By:		Date / Time:
Remarks:									

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FEBRUARY 12, 2001 PSTA DESTRUCTIVE SAMPLING EVENT - CON

PSTA

COC Number: P259 Project: HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR Kit Request ID: Lab: Ellen Patterson / USA 954.426.6112 x233 Laboratory Coordinator: 148010.01.05.CH Project #:

J				ı				
		Date & Time	Time		Number of			
Sample ID	Station ID	Collected	eted	Matrix	Containers		Analysis Requested	Comments
P2-0759	PP-3-CON 021501	97.50	1430	FF	1	TP_S , T: P		
P2-0760	PP-5-CON	-	1320	FT	1	TP_S T. P		
P2-0761	PP-10-CON		1445	FT	1	TP_S TIR		
P2-0762	PP-12-CON		1510	Ħ	1	TP_S T.P		
P2-0763	PP-14-CON		3651	Ħ	1	TP_S T.9		
P2-0764	PP-17-CON		०४५	FT	1	TP_S T.R		
P2-0765	PP-19-CON	-	\300	FF	1	TP_S TIR		
P2-0766	PP-20-CON	7	13/0	F	1	TP_S TR		
P2-0767	PP-21-CON 02/20/	105160	1635	Ħ	1	TP_S T'S		
P2-0768	PP-22-CON	/	1125	FT	-			
P2-0769	PP-FD1-CON	*	1512	F	-	TP_S TIS		
							•	
	••••							

	Date / Time:		Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:
Shipped Via: UPS	Shipped Via: UPS FedEx Hand Other (please specify):				
Received By:	Date / Time:	Cooler Temp:	Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:
Remarks:					

FEBRUARY 12, 2001 PSTA DESTRUCTIVE SAMPLING EVENT - BP

CH2M HILL Chain of Custody Form

PSTA

Analysis Requested TIP_P, TP_P TIP_P, TP_P TIP_P, TP_P TIP_P, TP_P TIP_P TIP_P TIP_P TIP_P TIP_P TIP_P TIP_P TIP_P TIP_P TIP_P TIP_P	Comments
P, TP_P P, TP_P P, TP_P P, TP_P P, TP_P	
P, TP_P P, TP_P P, TP_P P, TP_P P, TP_P P, TP_P	
P, TP_P P, TP_P P, TP_P P, TP_P P, TP_P P, TP_P P, TP_P	
P, TP_P 0 0 TP_P P, TP_P	
P, TP_P TD_B T_P P, TP_P	
P, TP_P	
P, TP_P	
P, TP_P	
P, TP_P	
0	
TIP_P, TP_P	
TP_P	
TIP_P, TP_P	
0	
Р, ТР_Р	
•	
P, TP_P	
TIP_P, TP_P	
0.	
TIP_P, TP_P	
TP_P	
TIP_P, TP_P	
TP_P	
Custody Seal: Y / N Relinquished By:	Date / Time:
Custody Seal: Y / N Relinquished By:	Date / Time:
Custody Seal: Y / N Relinquished By:	Date / Time:
	Seal: Y / N

FEBRUARY 12, 2001 PSTA DESTRUCTIVE SAMPLING EVENT - WP

VENT.WP CH2M HILL Chain of Custody Form

Generated on: 02/02/2001 1:32:07 PM

PSTA

COC Number:	P248 Pr	roject: HY	TON-BASED STORM	WATER TRE	ATMENT AREA	Project: HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	MONSTRATION PR	equest ID:	
Project #:	148010.01.05.CH	5.CH	Laboratory Coo	ordinator:	Ellen P	Ellen Patterson / USA 954.426.6112 x233	6112 x233	Lab: IFAS	
Sample ID	Station ID		Date & Time Collected	Matrix	Number of Containers	Analysis Requested	juested	Comments	
P2-0624	PP-3-WP	(95)39)	0.83.0	dd	1	TIP_P, TP_P			
P2-0625	PP-3-WP	-		ď	-	TP_P			
P2-0626	PP-5-WP	-	1351	ď	-	TIP_P, TP_P			
P2-0627	PP-5-WP	>	1881	d	-	<u> 4 d1</u>	-		
P2-0628	PP-10-WP	07/70		dd	-	TIP_P, TP_P	. :		
P2-0629	PP-10-WP	-		ЬР	1	<u> </u>			
P2-0630	PP-12-WP		333	ď	-	TIP_P, TP_P			
P2-0631	PP-12-WP	>	८५१	М	-	TP_P			
P2-0632	PP-14-WP	20150	9	dд	1	TIP_P, TP_P			
P2-0633	PP-14-WP	_	Shba	dd	1	TP_P			
P2-0634	PP-17-WP		7067	ЬР	1	TIP_P, TP_P			
P2-0635	PP-17-WP	7	1205	ЬЬ	1	TP_P			
P2-0636	PP-19-WP	10000		ď	-	TIP_P, TP_P			
P2-0637	PP-19-WP	_		ď	-	TP_P			
P2-0638	PP-20-WP		1001	dd	-	TIP_P, TP_P			
P2-0639	PP-20-WP	7	c001	dd	-	TP_P			
P2-0640	PP-21-WP	102120		ď	-	TIP_P, TP_P			
P2-0641	PP-21-WP	-		&	1	TP_P			
P2-0642	PP-22-WP		1601	ЬР	1	TIP_P, TP_P			
P2-0643	PP-22-WP	>	3/	ЬЬ	-	TP_P			
P2-0644	PP-FD1-WP	300		4	1	TIP_P, TP_P			
P2-0645	PP-FD2-WP	102120	1555	ЬР	1	ТР_Р			
P2-0646	PP-EB1-WP		1023	WQ	1	TIP_P, TP_P			
P2-0647	PP-EB2-WP	7		WQ	1	TP_P			:
Sampled By:			Date / Time:			Custody Seal: Y / N	Relinquished By:	Date / Time:	
Shipped Via:	UPS FedEx Ha	Hand Othe	Other (please specify):						
Received By:			Date / Time:	Cook	Cooler Temp:	Custody Seal: Y / N	Relinquished By:	Date / Time:	:
Received By:			Date / Time:	Cook	Cooler Temp:	Custody Seal: Y / N	Relinquished By:	Date / Time:	::
Remarks:									

FEBRUARY 12, 2001 PSTA DESTRUCTIVE SAMPLING EVENT - UPR

Sample ID State P2-0672 PP P2-0673 PP P2-0674 PP P2-0675 PP		140010.01.03.CA	Laboratory Coordi	rainator	z uerra	Ellen Patterson / USA 954.426.6112 x233	6112 x233	Lab: LFAS
	Station ID	Date Col	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	nested	Comments
	PP-3-UPR 0	107160	8/80	gs	1	TIP_SE, TP		
	PP-3-UPR	_	23.62	SD	-	TP_S		
	PP-5-UPR		C#0'	SD	1	TIP_SE, TP		
_	PP-5-UPR	_	oho/	as	-	S_dT		
P2-0676 PP.	PP-10-UPR		1535	SD	-	TIP_SE, TP		
	PP-10-UPR	_	25%	SD	1	TP_S		
P2-0678 PP	PP-12-UPR	-	5961	SD	-	TIP_SE, TP		
	PP-12-UPR		240	as	*-	TP_S		
P2-0680 PP	PP-14-UPR 07	1.5120	イバ	SD	-	TIP_SE, TP		
P2-0681 PP	PP-14-UPR		1515	SD	1	TP_S		
P2-0682 PP	PP-17-UPR		1841	SD	1	TIP_SE, TP		
P2-0683 PP	PP-17-UPR	٩	1435	SD	-	TP_S	:	
P2-0684 PP	PP-19-UPR 02/	170)	0577	SD	1	TIP_SE, TP		
P2-0685 PP	PP-19-UPR	-	1355	SD	1	TP_S		
P2-0686 PP	PP-20-UPR		1034	SD	1	TIP_SE, TP		
P2-0687 PP	PP-20-UPR		9401	SD	1	TP_S		
P2-0688 PP-	PP-FD1-UPR	P	434	SD	1	TIP_SE, TP		
P2-0689 PP-	PP-FD2-UPR 0	(4)20	37,90	SD	1	TP_S		
03000	Table R	-		3				
P2-0691 PP-	PP-EB1-UPR		1155	W	1	TIP_SE, TP		
	PP-EB2-UPR	_	1150	Wa	1	TP_S		
.ng polomes		Date	Date / Time:			Custody Seal: Y / N	Relinquished By:	Date / Time:
mipled by.								
Shipped Via: UPS	FedEx Hand		Other (please specify):					
Received By:		Date	Date / Time:	Cool	Cooler Temp:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Received By:		Date,	Date / Time:	Cook	Cooler Temp:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Remarks:								

COC Number:	P257	Project:	HYTON-BASED STORMWATER TRE	STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR Kit Request ID:	IONSTRATION PR	Kit Request ID:	
Project #:	148010.0	148010.01.05.CH	Laboratory Coordinator:	Ellen Patterson / USA 954.426.6112 x233	5112 ×233	Lab:	IFAS

		Date & Time	Time		Number of			
Sample ID	Station ID	Collected	sted	Matrix	Containers		Analysis Requested	Comments
P2-0741	PP-3-RTS	lonteo	1171	MC	1	TIP, TP_S		
P2-0742	PP-3-RTS		1181	Ş	1	TP_S		
P2-0743	PP-5-RTS		1415	MC	1	TIP, TP_S		
P2-0744	PP-5-RTS		5141	MC	Ļ	TP_S		
P2-0745	PP-10-RTS		84	MC	1	TIP, TP_S		
P2-0746	PP-10-RTS		cot!	MC	1	TP_S		
P2-0747	PP-12-RTS		0860	MC	1	TIP, TP_S		
P2-0748	PP-12-RTS	4	0060	MC	1	TP_S		
P2-0749	PP-14-RTS	1021501	CK 011	MC	1	TIP, TP_S		
P2-0750	PP-14-RTS		11030	MC	1	TP_S		
P2-0751	PP-17-RTS		8	MC	1	TIP, TP_S		
P2-0752	PP-17-RTS	>	oati	MC	-	TP_S		
P2-0753	PP-19-RTS	107020	0910	MC	-	TIP, TP_S		
P2-0754	PP-19-RTS	104000	5040	MC	+	TP_S		
P2-0755	PP-20-RTS	105120	1155	MC	-	TIP, TP_S		
P2-0756	PP-20-RTS	166140	1155	MC	-	TP_S		
P2-0757	PP-FD1-RTS	10 pit 0	0915	MC	-	TIP, TP_S		
P2-0758	PP-###RTS	104040	1121	MC	1	TP_S		
	203							

Sampled By:	Date / Time:		Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:	
Shipped Via:	UPS FedEx Hand Other (please specify):					
Received By:	Date / Time:	Cooler Temp:	Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:	
Received By:	Date / Time:	Cooler Temp:	Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:	
Remarks:			-			

FEBRUARY 12, 2001 PSTA DESTRUCTIVE SAMPLING EVENT - MAC

IFAS Project: HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR Kit Request ID: Lab: Laboratory Coordinator: Ellen Patterson / USA 954.426.6112 x233 **PSTA** 148010.01.05.CH P255 COC Number: Project #:

	Comments																				
	Analysis Requested		***																		
		TIP, TP_S	TP_S	TIP, TP_S	TP_S	TIP, TP_S	TP_S	TIP, TP_S	TP_S	TIP, TP_S	TP_S	TIP, TP_S	TP_S	TIP, TP_S	TP_S	TIP, TP_S	TP_S	TIP, TP_S	TP_S		
Number of	Containers	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	1	-	-		
	Matrix	MC	MC	MC	MC	MC	WC	WC	MC	MC	MC	WC WC	MC	MC	MC	MC	MC	MC	Ş		
Time	ted	mi	mil	50t1	5cm/	18891	1891	\$ 25	2355	029/	32	1650	311	3455	08 50	1150	115.	0400	mi		
Date & Time	Collected	104120					+	15/50	_				,	104170	19/120	108/20	021301	(क्रा/६०	154160		
	Station ID	PP-3-MAC	PP-3-MAC	PP-5-MAC	PP-5-MAC	PP-10-MAC	PP-10-MAC	PP-12-MAC	PP-12-MAC	PP-14-MAC	PP-14-MAC	PP-17-MAC	PP-17-MAC	PP-19-MAC 07 140	PP-19-MAC	PP-20-MAC	PP-20-MAC	PP-FD1-MAC	PP-FD2-MAC		
	Sample ID	P2-0723	P2-0724	P2-0725	P2-0726	P2-0727	P2-0728	P2-0729	P2-0730	P2-0731	P2-0732	P2-0733	P2-0734	P2-0735	P2-0736	P2-0737	P2-0738	P2-0739	P2-0740		

Sampled By:	Date / Time:		Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:
Shipped Via:	Shipped Via: UPS FedEx Hand Other (please specify):	ł.			
Received By:	Date / Time:	Cooler Temp:	Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:
Received By:	Date / Time:	Cooler Temp:	Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:
Remarks:					

			1480	10.P2.06.C	ж				•
Porta-PSTA:	@	2	3	4	5	6	7	8	
	· 9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank
Type of Monitoring:	Weekly		Monthly		Quarter	ly	Date :	0212	101
Field Team:	Lw.	FB.	CY					(See page 1	unless otherwise noted)
Weather Conditions:	most	ly s	sunny	·				(See page 1	unless otherwise noted)
Field Measurements:		Miniso	nde#	2	_	Staff	<u> ચય</u>	-	
	<u>Infl</u>	<u>w</u>		Cente	er (NA)		<u>Out</u>	<u>flow</u>	
Time:	105	21				_	10:34 2		•
D.O., mg/L	3.4					_		6.4 5	14
% DO Saturation:	39.	4					5	6.4	,
Temperature, °C:	<u> 21.</u>	61					<u> </u>	1.29	
рH	7.2		 -			<u> </u>		.31	
Conductivity ms/cm		45						र्भर	-
TDS, g/L	0.79	341				_	٥.٠	7984	
Sampling Location:	Mid-d at inf				-depth er of tank			depth utflow	
Water Quality Samples:				_			_		
	Inflow	<u>(NA)</u>		Cente	er (NA)			flow	
Sample Time:				8.6:4	do oth	_	10:	09_	•
Sampling Location:	Inflow	pipe			-depth er of tank		Outflo	ow pipe	
QA/QC Samples:	<u>Dupli</u>	cate		Equip	o. blank		No	one	
Location:	Infl Cnt	r Outfl		1	NA				
Sample Time:						_			
Sample ID:	PP -	- W	- -	PP -	- W				
Comments:				1					_
			10-	7					
Notetaker Signature	:	<u> </u>	w	4					_
	-			1					

			1480	10.P2.06.C	Ж				
Porta-PSTA:	1	(2)	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank
Type of Monitoring:	Weekly		Monthly		Quarteri	у	Date:	02.	12.01
Field Team:							_	(See page 1	unless otherwise noted)
Weather Conditions:							-	(See page 1	unless otherwise noted)
Field Measurements:		Ainison	de#	2	-	Staff	21/4		
~ •	<u>Inflo</u>			Cente	er (NA)		<u>Outf</u>		
Time:	<u> </u>						100		.
D.O., mg/L % DO Saturation:	4.10	<u>, </u>				_	<u>a.9</u> 34.		- ·
Temperature, °C:	21.80	<u>}</u>	- ·			_		•	_
pH		Š	-			_	7.3	5	_
Conductivity ms/cm	1.25		•					, <u>a</u>	_
TDS, g/L	0.80		- .			-	0.7	488	-
Sampling Location:	Mid-de at infl	epth			-depth er of tank	_	Mid-o		_
Water Quality Samples:									
Sample Time:	inflow	(NA)		Cente	er (NA)	_	<u>Outl</u>		_
Sampling Location:	Inflow	pipe			-depth er of tank		Outfloo	w pipe	
QA/QC Samples:	Duplic	ate		Equip	. blank		<u>No</u>	<u>ne</u>	<u>-</u>
Location:		Outfl	_		AA	_			
Sample Time:	*					_			
Sample ID:	PP -	- W		PP -	- W	_			
Comments:	Se	<u>ئى</u>	Ls	4					_
Notetaker Signature:	\mathcal{A}	9	' /	1			·		_

			1480	010.P2.06.C	ж				
Porta-PSTA:	1	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank
Type of Monitoring:	Weekly		Monthly		Quarterl	у	Date :		·
Field Team:	·							(See page 1	unless otherwise noted)
Weather Conditions:		· · · · · · · · · · · · · · · · · · ·					_	(See page 1	unless otherwise noted)
Field Measurements:	8	Ainisor	nde#	2	_	Staff	23		
	<u>Inflo</u>	w		Cente	r (NA)		<u>Out</u>	flow	
Time:	103		 .			_	103		
D.O., mg/L		3_					5.3	57	
% DO Saturation:	49.				····································		61.	5	
Temperature, °C:		8				_	21.	7.7	
pH	-7.3					_	<u> 7. ë</u>	34	
Conductivity ms/cm	1.143						1.17	<u> </u>	
TDS, g/L	0.73	40	 .				0.7	<u> 503 </u>	
Sampling Location:	Mid-de at inflo				depth er of tank			depth itflow	
Water Quality Samples:									
	Inflow	(NA)		Cente	<u>r (NA)</u>		Out	flow	
Sample Time:	•					_	100	5	
Sampling Location:	Inflow p	oipe			depth r of tank		Outflo	w pipe	
QA/QC Samples:	Duplic	ate		Equip	. blank		No	ne	<u>-</u>
Location:	Infl Cntr	Outfl			A				
Sample Time:			-			-			
Sample ID:	PP -	- W		PP -	- W	-			
Comments:									
Notetaker Signature:		10	w	2/	1	1			

			1480	10.P2.06.C	/H				
Porta-PSTA:	1	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank
Type of Monitoring:	Weekly		Monthly		Quarter	ly	Date :		
Field Team:						***************************************	_	(See page 1	unless otherwise noted)
Weather Conditions:							_	(See page 1	unless otherwise noted)
Field Measurements:		Miniso	nde #	2	_	Staff	24		
	Inflo	<u>w</u>		Cente	er (NA)		Out	low	
Time:	10.	3.3				_	10:3		_
D.O., mg/L	5 . 2	3					5,	49	_
% DO Saturation:	(0.)					62	<u>23</u>	_
Temperature, °C:	2à.;	छ	•				a	1.38	_
ρΗ	7.3	<u>a</u>	······					7.45	_
Conductivity ms/cm	1.0						j,	060	_
TDS, g/L	0.0	:83	<u> </u>				0,	6765	_
Sampling Location:	Mid-de at infl	epth			-depth er of tank		Mid-c	depth tflow	
Water Quality Samples:									
	<u>inflow</u>	<u>(NA)</u>		Cente	er (NA)			flow	
Sample Time:								<u> </u>	_
Sampling Location:	Inflow	pipe			-depth er of tank		Outflo	w pipe	
QA/QC Samples:	Dupli	<u>cate</u>		<u>Eguir</u>	o. blank		<u>No</u>	<u>one</u>	
Location:	Infl Cnt	r Outf	1_		NA	_			
Sample Time:									
Sample ID:	PP -	- V	<u>/</u>	PP -	- W	<u>'</u>			
Comments:									_
Notetaker Signature:	Mich	ulle	Lagh						_

			1480	10.P2.06.0	H				
Porta-PSTA:	1	2	3	4	(5)	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tan
Type of Monitoring:	Weekly		Monthly		Quarterly	y	Date :	2.1:	2.01
Field Team:							_	(See page 1	unless otherwise n
Weather Conditions:							_	(See page 1	unless otherwise n
Field Measurements:	1	Minisor	ıde#	2	_	Staff	_13_		
	<u>Infl</u>			Cente	er (NA)		Out		
Γime:	10:50	<u> </u>				_		55	•
D.O., mg/L	4.0	0				_	4.9		-
% DO Saturation:	<u>45</u>				_	-	5.4	-	
Temperature, °C:					-		. 74	•	
pH	7.3	1				_		1.39	-
Conductivity ms/cm	1.2	Σ				_		311	-
TDS, g/L	_0.77	7				_		1161	_
Sampling Location:	Mid-de at inf				-depth er of tank			depth utflow	
Nater Quality Samples:									
	Inflow	(NA)		Cente	er (NA)			flow	
Sample Time:	•					_	101	0	-
Sampling Location:	Inflow	pipe			-depth er of tank		Outflo	w pipe	
QA/QC Samples:	<u>Dupli</u>	<u>cate</u>		<u>Equi</u>	o. blank		<u>No</u>	one .	
ocation:	Infl Cnt	r Outfl			NA	_			
Sample Time:						_			
Sample ID:	PP -	- W	_	PP -	- W	-			
Comments:									
		11	JL					-	-
Notetaker Signature	: <u> "uch</u>	ull	Last						_

			1480	10.P2.06.0	СН				
Porta-PSTA:	1	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank
Type of Monitoring:	Weekly		Monthly		Quarterl	у	Date:	2.12	2.01
Field Team:		<u>.</u> <u>.</u>						(See page 1	unless otherwise noted)
Weather Conditions:								(See page 1	unless otherwise noted)
Field Measurements:	ı	Minison	de# _	2	_	Staff	241/2		
	<u>Inflo</u>			Cente	er (NA)		Outf		
Time:	11:0					_			-
D.O., mg/L	1.8	<u>6</u>		· · · · · ·		-	5.0		-
% DO Saturation:	<u> </u>	1				_		<u>,,9</u>	-
Temperature, °C:		12				_		56	-
pH Conductivity major		<u>ઝ્ર</u> 37	-			-		58 120	-
Conductivity ms/cm TDS, g/L	1 70	15				_		865	-
_	Mid-de	• •		Mid	-depth	_	Mid-d		-
Sampling Location:	at infl				er of tank		at ou		
Water Quality Samples:									
0. 1. 77	Inflow	(NA)		<u>Cent</u>	er (NA)		<u>Outf</u>		
Sample Time:				Mid	-depth	-	101	<u>J</u>	_
Sampling Location:	Inflow	pipe			er of tank		Outflox	w pipe	
QA/QC Samples:	<u>Dupli</u>	cate		Equip	o. blank		<u>No</u>	<u>ne</u>	
Location:	Infl Cnt	r Qutil	Σ.		NA	_			
Sample Time:	102					_			
Sample ID:	PP - FD)\ -W		PP -	- W	_			
Comments:									_
	M	hall	Lagh						
Notetaker Signature	:		vign						_

			148	010.P2.06.	CH				
Porta-PSTA:	1	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank
Type of Monitoring:	Weekly		Monthly		Quarter	·ly	Date :	ي .	12.01
Field Team:								(See page 1	unless otherwise noted)
Weather Conditions:							_		unless otherwise noted)
Field Measurements:	ľ	Miniso	nde #	2		Staff	12		
	<u>Infl</u>	<u>w</u>		Cente	er (NA)		Outf	low	
Time:	11:10						11:	.15	
D.O., mg/L	4.17)					4	.60	•
% DO Saturation:	48.0	1	_				4	2.3	•
Temperature, °C:	22.6	03				_	3	1.46	•
pH	7.4	18				_		7.57	•
Conductivity ms/cm	1.2	10				_	1.	186	•
TDS, g/L	0.77	12	_			_	0.7	1605	•
Sampling Location:	Mid-de at infl		_		-depth er of tank	_	Mid-d	epth	•
Water Quality Samples:									
	Inflow	<u>(NA)</u>		Cente	er (NA)		Outf	<u>low</u>	
Sample Time:						_	1015	5	
Sampling Location:	Inflow p	oipe			-depth er of tank		Outflov	v pipe	
QA/QC Samples:	Duplic	ate		<u>Equip</u>	o. blank		No	ne	
Location:	Infl Cntr	Outfl	_		NA				
Sample Time:									
Sample ID:	PP -	- W		PP -	- W	_			
Comments:									
Notetaker Signature:	Mich	elle	Lay	t					
			- A						

			1480	10.P2.06.C	Н			•	
Porta-PSTA:	1	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank
Type of Monitoring: Field Team: Weather Conditions:	Weekly		Monthly		Quarterly	y	Date:	(See page 1	2.01 unless otherwise noted)
Field Measurements:	ı	Minisor	nde#	2	-	Staff	12		
Time: D.O., mg/L % DO Saturation: Temperature, °C: pH Conductivity ms/cm TDS, g/L Sampling Location: Water Quality Samples: Sample Time: Sampling Location:	Inflow Inflow Inflow	8 1 3 .23 .16 .22 .19 .epth		Mid- at cente	depther of tank er (NA) depther of tank	-	1, 6 0, 7 Midat or	flow 25 3.8) 3.61 7.47 210 7.77 depth atflow 20 ow pipe	
QA/QC Samples: Location: Sample Time: Sample ID:	Duplion Infl Control	cate r Outfl	 .		o. blank NA - W	- - -	<u>No</u>	<u>one</u>	
Comments: Notetaker Signature:	Much	elk	Lajt	ī					- -

			1480	10.P2.06.C	Н				•
Porta-PSTA:	1	2	3	4	5	6	7	8	
	(9)	10	11	12	13	14	15	16	
									tte ed Tent
	17	18	19	20	21	22	23	24	Head Tank
Type of Monitoring:	Weekly		Monthly		Quarterly	y	Date :	2. le	2.01
Field Team:							_ ((See page 1	unless otherwise noted)
Weather Conditions:							- '	(See page 1	unless otherwise noted)
Field Measurements:	ı	Minisor	nde#	2	-	Staff	12/2		
	<u>Inflo</u>			<u>Cente</u>	r (NA)		Outf		
Time:	W: 3					-		35	
D.O., mg/L	2.3	3				-	7	10	
% DO Saturation:	2/1	<u>।</u> ट्रंप	- ·	· · · · · · · · · · · · · · · · · · ·		-	21	6,4.	•
Temperature, °C:	7	36	_			-		753	-
Conductivity ms/cm	1.	224				_	7	111	•
TDS, g/L	07	883				_	0.	7255	•
Sampling Location:	Mid-de	epth			depth er of tank	-	Mid-d	lepth	•
Water Quality Samples:									
	Inflow	<u>(NA)</u>		Cente	er (NA)		Outf		
Sample Time:			_			_	100	<u>(</u>	-
Sampling Location:	Inflow	pipe			depth er of tank		Outflov	w pipe	
QA/QC Samples:	Dupli	<u>cate</u>		Equip	. blank		<u>No</u>	<u>ne</u>	
Location:	Infl Cnt	Outfl		1	1A	_			
Sample Time:	100	4				_			
Sample ID:	PP-FD	2 - W	<u> </u>	PP -	- W	_			
Comments:									-
Notetaker Signature:	Much	ulle	Lagt	<u>i</u>		<u> </u>			-

			1480	10.P2.06.C	Н	•		•	
Porta-PSTA:	1	2	3	4	5	6	7	8	
	9	@	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank
Type of Monitoring: Field Team: Weather Conditions:	Weekly		Monthly		Quarterl	у	-		unless otherwise noted)
Field Measurements:		Minison	nde #	2	_	Staff	12/2		uness otherwise roted)
Time: D.O., mg/L % DO Saturation: Temperature, °C: pH Conductivity ms/cm TDS, g/L Sampling Location: Water Quality Samples: Sample Time: Sampling Location:	33 22 1.1	10 73 .9 .02 7.38 43 251 epth ow	- · · · · · · · · · · · · · · · · · · ·	Mid- at cente	depth er (NA)	-	Mid-at ou	: 43 3, 15 35, 9 1, 60 7, 40 , 138 7,380 depth utflow	
QA/QC Samples: Location: Sample Time: Sample ID:	Duplic Infl Cntr	cate			. blank IA - W	- - -	<u>No</u>	one	
Comments: Notetaker Signature:	- Mich	elle	Layta						

			1480	10.P2.06.0	СН				
Porta-PSTA:	1	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank
Type of Monitoring:	Weekly		Monthly		Quarterl	у	Date :	2.1	2.01
Field Team:								(See page 1	unless otherwise noted)
Weather Conditions:							- -	(See page 1	unless otherwise noted)
Field Measurements:	ı	Miniso	nde #	2	_	Staff	_11		
	Inflo	<u>w</u>		<u>Cente</u>	er (NA)		<u>Out</u>	flow	
Time:	/(: 4	45						<i>5</i> 0	_
D.O., mg/L	2.8	15				_	3	.19	-
% DO Saturation:	3	1.5				_	3	5.6	_
Temperature, °C:	21.71		<u> </u>			_		11.25	_
ρΗ	7.3	8	<u></u>			_		7.41	_
Conductivity ms/cm	1,26	16	·····			_		075	_
TDS, g/L	0.73	276	_			_	0.6	<i>980</i>	_
Sampling Location:	Mid-de at infl				-depth er of tank			depth utflow	
Water Quality Samples:									
Sample Time:	Inflow	<u>(NA)</u>		Cente	er (NA)		<u>Out</u> 101	flow 2	
Sampling Location:	Inflow	pipe			-depth er of tank	_		w pipe	-
QA/QC Samples:	<u>Dupli</u>	<u>cate</u>		Equip	o. blank		<u>No</u>	ne	
Location:	Infl Cntr	Outf	<u> </u>		NA				
Sample Time:	4		<u> </u>			_			
Sample ID:	PP -	- W		PP -	- W	- .			
Comments:									_
Notetaker Signature	Min	h.00	e Lai	*		-			
	- / 🗸	. ~~.	~ • • • • • • • • • • • • • • • • • • •						_

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Porta-PSTA:	1	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank
Type of Monitoring:	Weekly		Monthly		Quarter	ly	Date : _	2.1	2.01
Field Team:							_ (3	See page 1	unless otherwise noted
Weather Conditions:							_ (3	See page 1	unless otherwise noted
Field Measurements:		/linisor	nde#	2	-	Staff	11/2		
***	<u>inflo</u>			Cente	r (NA)		Outfl //•		
Time:	11:5							59	•
D.O., mg/L % DO Saturation:	<u>3,4</u>					_	2.9		-
	22				_	27		-	
Temperature, °C:	7.				_		مال	•	
Conductivity ms/cm		30	-			_	7.35		
TDS, g/L	7.7	421			····	_	0,7171		
	Mid-de	enth		Mid-	depth	_	Mid-depth		
Sampling Location:	at infle				er of tank		at outflow		
Water Quality Samples:									
	Inflow	<u>(NA)</u>		<u>Cente</u>	r (NA)		Outfl		
Sample Time:	•						1015)	•
Sampling Location:	Inflow p	oipe			depth er of tank		Outflow	pipe	
QA/QC Samples:	Duplio	ate		<u>Equip.</u>	. blank		Non	<u>ie</u>	
Location:	Infl Cntr	Outfl		N	IA	_			
Sample Time:									
Sample ID:	PP -	- W		PP -	- W	_			
Comments:									
Notetaker Signature:	Mic	relle	Hap	\					•

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Porta-PSTA:	1	2	3	4	5	6	7	8				
	9	10	11	12	13	14	15	16				
	17	18	19	20	21	22	23	24	Head Tank			
Type of Monitoring:	Weekly		Monthly		Quarterly	<i>(</i>	Date : 2 · 12 · 01					
Field Team: Weather Conditions:							-		inless otherwise noted)			
Field Measurements:	1	Minisor	nde#	2	_	Staff	12/2					
Time:	inflo	<u>w</u> 02		Cente	er (NA)		Outfl 12	<u>ow</u> 35				
D.O., mg/L		30				-		40	-			
% DO Saturation:	<u></u>	9	- ·			-	4,	54				
Temperature, °C:	26.6	<u> </u>				-		, 43				
pH	7	27				-	.7	31				
Conductivity ms/cm	1.2	53	- ·			-	1.	266				
TDS, g/L	0.80	<u> </u>	_			-		3090				
Sampling Location:	Mid-de at inf	-	<u> </u>		depth er of tank	-	Mid-de at out	epth				
Water Quality Samples:	1 21	/A1A\		04-	(AIA)		046					
Sample Time:	Inflow	(NA)		Cente	er (NA)	_	<u>Outfl</u>					
Sampling Location:	Inflow	pipe			-depth er of tank		Outflow	, pipe				
QA/QC Samples:	<u>Dupli</u>	<u>cate</u>		Equip	. blank		<u>Nor</u>	<u>1e</u>				
Location:	Infl Cnt	r Outfl	 .	1	NA	-						
Sample Time:			_		v. * · · · · · · · · · · · · · · · · · ·	-						
Sample ID:	PP -	- W	· 	PP -	- W	-						
Comments:												
Notetaker Signature:		liche	lle X	agti								

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Porta-PSTA:	1	2	3	4	5	6	7	8				
	9	10	11	12	13	14)	15	16				
	17	18	19	20	21	22	23	24	Head Tank			
Type of Monitoring:	Weekly		Monthly		Quarterly	y	Date: 2.12.01					
Field Team:						····	. (See page 1	unless otherwise noted)			
Weather Conditions:							_ (See page 1	unless otherwise noted)			
Field Measurements:	į	Minisor	nde#	2	_	Staff	12/2					
	<u>Infl</u>	<u>ow</u>		Cente	er (NA)		Outf					
Time:	12:	05				_	12	10				
D.O., mg/L	2.	34				_	3,	62				
% DO Saturation:	2	6.7				_	4	2.0				
Temperature, °C:		93				_	2	<u>2.33</u>	!			
pН	7	.33				_		7.37				
Conductivity ms/cm	<u> </u>	088				_		<u> 252</u>				
TDS, g/L	0.6	964				_	0,2	3012				
Sampling Location:	Mid-d at in				depth er of tank		Mid-depth at outflow					
Water Quality Samples:	Inflow	(AIA)		Conto	er (NA)		Outf	low				
Sample Time:	mnow	<u> </u>		Octive	a (NA)		102					
Sampling Location:	Inflow	pipe	•		depth er of tank	-	Outflov		•			
QA/QC Samples:	<u>Dupli</u>	<u>icate</u>		<u>Equip</u>	. blank		No	<u>ne</u>				
Location:	Infl Cnt	r Outfl		1	NA .	_						
Sample Time:						_						
Sample ID:	PP -	- W	. .	PP -	- W	-						
Comments:												
Notetaker Signature		hell	, Kajt	_					_			

			1480)10.P2.06.0	CH					
Porta-PSTA:	1	2	3	4	5	6	7	8		
	9	10	11	12	13	14	15	16		
	17	18	19	20	21	22	23	24	Head Tank	
Type of Monitoring:	Weekly		Monthly		Quarteri	y	Date :	۵.	12.01	
Field Team:								(See page 1	unless otherwise noted)	
Weather Conditions:							_	(See page 1	unless otherwise noted)	
Field Measurements:	ı	Minisor	nde#	2	_	Staff	23			
Time:	Inflo	<u>:1</u> 5		Cente	er (NA)	_	Outflow (2:20)			
D.O., mg/L	3	.23				_	1.	75	_	
% DO Saturation:	3	8.0				- 	10	7.2	_	
Temperature, °C:	23,	22	_			_	21	.45	<u> </u>	
ρН		36				·	7.	35	_	
Conductivity ms/cm		208	2			_	[.]	65	_	
TDS, g/L	O	7565	<u></u>			_	0.70	690	_	
Sampling Location:	Mid-de at infl	-			-depth er of tank		Mid-d at out	•		
Water Quality Samples:										
Sample Time:	Inflow	<u>(NA)</u>		Cente	er (NA)	<u>.</u>	<u>Outf</u>		_	
Sampling Location:	Inflow	pipe			-depth er of tank		Outflov	w pipe		
QA/QC Samples:	Duplic	cate		<u>Equip</u>	o. blank		<u>No</u>	<u>ne</u>		
Location:	Infl Cntr	Outfl			NA					
Sample Time:	•		<u> </u>			_				
Sample ID:	PP -	- W	_	PP -	- W	_				
Comments:						· · · · · · · · · · · · · · · · · · ·			_	
Notetaker Signature	. M	lich	M X	小大						

148010.P2.06.CH												
Porta-PSTA:	1	2	3	4	5	6	7	8				
	9	10	11	12	13	14	15	16				
	17	18	19	20	21	22	23	24	Head Tank			
Type of Monitoring:	Weekly		Monthly		Quarter	ly	Date:	2.12	1.01			
Field Team:			 					(See page 1	unless otherwise noted)			
Weather Conditions:	•						_	(See page 1	unless otherwise noted)			
Field Measurements:	ı	Miniso	nde#	2	-	Staff	13					
	Inflo			Cente	er (NA)			flow				
Time:		<u>00 </u>					12:	05	•			
D.O., mg/L	2.5	0				_		50	• .			
% DO Saturation:	31.					26.	5,0 18	•				
Temperature, °C: pH	7.						.23	-				
Conductivity ms/cm	1.19						324	•				
TDS, g/L	0.72	343				_		7825	-			
Sampling Location:	Mid-de	-	•		depth er of tank	_	Mid-	depth utflow	•			
Water Quality Samples:												
	Inflow	<u>(NA)</u>		Cente	er (NA)			flow				
Sample Time:				14:4		_	10.	35	-			
Sampling Location:	Inflow	pipe			depth er of tank		Outflo	w pipe				
QA/QC Samples:	<u>Duplic</u>	cate		<u>Equip</u>	. blank		<u>N</u> c	one .				
Location:	Infl Cntr	Outfl		1	NA							
Sample Time:												
Sample ID:	PP -	- W	- -	PP -	- W	, 						
Comments:												
	M .1.	16	9.4			· · · · · · · · · · · · · · · · · · ·			-			
Notetaker Signature	: I'UCX	سلللا	Lapte		·				-			

Field Sheet ENR South Test Cells Monitoring Periphyton-Based Stormwater Treatment Area (PSTA) Project

148010.01.04.CH

Monitoring Location:	Head Cell			Porta-1514 1
Type of Monitoring:	Weekly	Monthly	Quarterly	
Field Team:				(See page 1 unless otherwise noted)
Weather Conditions:				(See page 1 unless otherwise noted)
Date:				
Field Measurements:		Minisor	1 de #	Total depth, ft: 23 //
			Mid-depth	12 de la companya della companya della companya de la companya del
Time:				12:02
Sampling depth, ft:		8 99		R 40 B
Dissolved Oxygen, mg/L:	1	3.06		3:72
% DO Saturation:				- 0.61.7
Temperature, °C:	7 63		•	7:46
pH, SU:	1.2			- 7:79
Conductivity, mS/cm: TDS, g/L	0.39	3 3		0.8072
Water Quality Samples:				
Sample Time:				
Sampling depth, ft:	•			
QA/QC Samples:	Duplica	<u>te</u>	<u>Equip. blank</u>	None
Location:	out.		NA .	_
Sample Time:	1035			_
Sample ID:	3 6-	- W	TC W	- -
	PP-FD	<u>-w</u> 3-ω		
Comments				
Notatakan Clareste				
Notetaker Signatur	JEEF T			

Field Sheet **ENR South Test Cells Monitoring** Periphyton-Based Stormwater Treatment Area (PSTA) Project

		14	18010.01.0	4.CH	ad whale
Monitoring Location:	Manage	\$	end cell.		Bota-PST4 18
Type of Monitoring:	Weekly	Monthly	Q	uarterly	
Field Team:			····		(See page 1 unless otherwise noted)
Weather Conditions:			,		(See page 1 unless otherwise noted)
Date:					
Field Measurements:	Int	/ow MI	inisonde #	<u>\$</u>	Total depth, ft: 23
Time:	11:4	Š	Mid-de	<u>iptn</u>	11:49
Sampling depth, ft:					
Dissolved Oxygen, mg/L:	86.3				6.40
% DO Saturation:	15:				73.5
Temperature, *C:	66.3	/			
pH, SU:	1.35				7.33
Conductivity, mS/cm:		Er -			0.3889
TDS, g/L					
Water Quality Samples:					
Sample Time:		<u> </u>			
Sampling depth, ft:					
QA/QC Samples:	<u>Duplic</u>	ate	<u>Equip. (</u>	<u>blank</u>	<u>None</u>
Location:			N.A	\	
Sample Time:			-		_
Sample ID:	TC-	-W	TC-	- W	
Comments			·		
Notetaker Signatur	· 1				

148010.P2.06.CH												
Porta-PSTA:	1	2	3	4	5	6	7	8				
	9	10	11	12	13	14	15	16				
	17	18	(9)	20	21	22	23	24	Head Tank			
Type of Monitoring:	Weekly		Monthly		Quarter	у	Date	:				
Field Team:								(See page 1	unless otherwise noted)			
Weather Conditions:							_	(See page 1	unless otherwise noted)			
Field Measurements:		Minisor	nde#	3		Staff	22					
	Inflo	w	•	Cente	er (NA)		Ou	 tflow				
Time:	11.3	H		331113				37				
D.O., mg/L	4.5	3					5.4	15	-			
% DO Saturation:	53.	5	-			_	68		-			
Temperature, °C:	21,3	8	-			_	21.6	59	-			
pН	7.4	5 .					7.5	3	-			
Conductivity ms/cm	7.23	6				-	7.2	34	-			
TDS, g/L	0,34	15	_			-	0,7	977	-			
Sampling Location:	Mid-de at infl				depth er of tank			-depth outflow	-			
Water Quality Samples:	4.			at och	31 01 WIII		aro	duion				
water Quality Samples:	Inflow	(NA)		Cente	er (NA)		Out	tflow				
Sample Time:					<u> </u>		703					
Sampling Location:	1-0	. •			depth	-			-			
	Inflow	oibe		at cente	er of tank		Outfle	ow pipe				
QA/QC Samples:	Duplio	ate		Equip	. blank		N	one				
Location:		Outfl			IA							
Sample Time:			_			-						
Sample ID:	PP -	- W	- -	PP -	- W	-						
Comments:												
Notetaker Signature	1	1	/						. -			

			148	010.P2.06.C	<u>H</u>				·-·
Porta-PSTA:	1	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank
Type of Monitoring: Field Team:	Weekly		Monthly		Quarter	ty	Date :		unless otherwise noted)
Weather Conditions:									unless otherwise noted)
Field Measurements:	ŀ	Miniso	nde #	3		Staff	253	4	
Time:	Inflo	<u>w</u>		Cente	r (NA)		Out	flow	
D.O., mg/L	7.2					-	3.4	2	_
% DO Saturation:	37.8						17		-
Temperature, °C:	21.30	D .	· ·	• • • • • • • • • • • • • • • • • • • •			21.		_
pH	7.56					_	7.3	3	-
Conductivity ms/cm	1.31						1.21	.4	-
TDS, g/L	0.38	96				_	0.7	771	_
Sampling Location:	Mid-de at infk			Mid-c at center	-			depth utflow	
Water Quality Samples:									
Sample Time:	Inflow	(NA)		Center	<u>r (NA)</u>	****	<u>Out</u>	flow	_
Sampling Location:	Inflow p	oipe		Mid-c at center			Outflo	w pipe	
QA/QC Samples:	Duplic	ate		Equip.	blank		<u>No</u>	one	
Location:	Infl Cntr	Outfl		N.	A	_			
Sample Time:				 					
Sample ID:	PP -	- W	- -	PP -	- W	incet			
Comments:						···········		· · · · · · · · · · · · · · · · · · ·	-
Notetaker Signature	JE,		√					<u>.</u>	-

148010.P2.06.CH												
Porta-PSTA:	1	2	3	4	5	6	7	8				
	9	10	11	12	13	14	15	16				
	17	18	19	20	21	22	23	24	Head Tan			
Type of Monitoring:	Weekly		Monthly		Quarter	ly	Date:		1			
Field Team:								(See page 1	unless otherwise no			
Weather Conditions:								(See page 1	unless otherwise no			
Field Measurements:		Miniso	nde #	3		Staff	32 1/	4				
	<u>Inflo</u>	w	•	Cent	er (NA)		Outf	low				
Time:	## 10 21	7		<u>Jein</u>	<u> </u>		11:Z					
D.O., mg/L	6,5	7				_	6.8	•	-			
% DO Saturation:	36.	0				-	74.	3	-			
Temperature, °C:	22.1	45	-			•	22.	7	-			
рН	7.5	1				_	7.5	3	-			
Conductivity ms/cm	1,22	2	<u>. </u>			_	7.2	4	-			
TDS, g/L	0.78	<u> 25</u>				<u>.</u>	9.7	9 /	5			
Sampling Location:	Mid-de at infl				-depth er of tank		Mid-d at out	•				
Water Quality Samples:												
	Inflow	(NA)		Cent	er (NA)		<u>Outf</u>	low				
Sample Time:								5	-			
Sampling Location:	Inflow	pipe			-depth er of tank		Outflov	v pipe				
QA/QC Samples:	<u>Duplic</u>	ate		<u>Equip</u>	o. blank		No	<u>ne</u>				
ocation:	Infl Cntr	Outfl	<u> </u>		NA	_		_				
Sample Time:						_						
Sample ID:	PP -	- W		PP -	- W	_						
Comments:												
	M	24						- <u></u>	•			
Notetaker Signature		X							_			

148010.P2.06.CH												
Porta-PSTA:	1	2	3	4	5	6	7	8				
	9	10	11	12	13	14	15	16				
	17	18	19	20	21	22	23	24	Head Tank			
Type of Monitoring:	Weekly		Monthly		Quarter	ly	Date:	7.	19.01			
Field Team:	•					· · · · · · · · · · · · · · · · · · ·			unless otherwise noted)			
Weather Conditions:								(See page 1	unless otherwise noted)			
Field Measurements:		Ainiso	nde#	<u>3</u>	_	Staff	3	-				
	Inflo	w		Cent	er (NA)		<u>Out</u>	flow				
Time:		<u></u>				_			-			
D.O., mg/L	_6,3	4				_	<u></u>	91	-			
% DO Saturation:	73.	5.	-				_8'	24	-			
Temperature, °C:	_22		.				44	.33	-			
ρН	7.0	汉					-74]	N.	-			
Conductivity ms/cm	1.3	41	<u>.</u>					05	•			
TDS, g/L	0.7	73] .				9.7	72				
Sampling Location:	Mid-de at infl				l-depth ter of tank			depth utflow				
Water Quality Samples:												
	Inflow	<u>(NA)</u>		<u>Cent</u>	er (NA)			<u>flow</u>				
Sample Time:	***************************************					_	\03	0 102	7			
Sampling Location:	Inflow	pipe			l-depth ter of tank		Outflo	w pipe				
QA/QC Samples:	Duplic	cate		<u>Equi</u>	p. blank		<u>No</u>	one				
Location:	Infl Cntr	Outfl			NA	_						
Sample Time:			 .			_						
Sample ID:	PP -	- W		PP -	- W	_						
Comments:									_			
Notetaker Signature:									_			

148010.P2.06.CH												
Porta-PSTA:	1	2	3	4	5	6	7	8				
	9	10	11	12	13	14	15	16				
	17	18	19	20	21	22	23	24	Head Tank			
Type of Monitoring:	Weekly		Monthly		Quarter	ly	Date :	3.	19.01			
Field Team:		<u> </u>						(See page 1	unless otherwise noted)			
Weather Conditions:								(See page 1	unless otherwise noted)			
Field Measurements:	ı	Miniso	nde#	3		Staff	201/	}				
	Inflo	w		Cent	er (NA)		Outf	low				
Time:	Tie					_	112	27_	_			
D.O., mg/L	_4,	55					_5.4		-			
% DO Saturation:	53.					-		T.C	<u> </u>			
Temperature, °C:	34	47	 -			_	41,	<u> </u>	-			
ρH	7.3						7.5	3,	-			
Conductivity ms/cm	1.3	٧,				_		14 .	•			
TDS, g/L	9.7	79	.			_	<u>0.7</u>	76	Z			
Sampling Location:	Mid-de at infl				i-depth ter of tank		Mid-o at ou					
Water Quality Samples:												
valor duality outliploor	Inflow	(NA)		Cent	er (NA)		<u>Outl</u>	<u>flow</u>				
Sample Time:						_	703	0	_			
Sampling Location:	Inflow	pipe			depth ter of tank		Outflo	w pipe				
QA/QC Samples:	Duplie	<u>cate</u>		<u>Equi</u>	p. blank		<u>No</u>	ne				
Location:	Infl Cnt	Outf			NA							
Sample Time:												
Sample ID:	PP -	- W		PP -	- W							
Comments:												
Notetaker Signature:									_			

			1400	10.F2.00.	<u> </u>				
Porta-PSTA:	1	2	3	4	5	6	. 7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	Head Tank
Type of Monitoring: Field Team:	Weekly		Monthly		Quarter	ly	Date :		
Weather Conditions:							-		unless otherwise noted) unless otherwise noted)
Field Measurements:	ı	Miniso	nde#	3	-	Staff	24		
Time:	<u>Inflo</u>	w A		Cente	er (NA)		Out	low	
D.O., mg/L	23		- •				47	3	
% DO Saturation:	LU	5					7	3	
Temperature, °C:	22.3	5	- .				3	5	
рН	3	M	-			_	7		
Conductivity ms/cm	1.20	40	-			-	1.2	47	
TDS, g/L	0.7	934	<u> </u>			····	0.7	976	
Sampling Location:	Mid-de at infl				depth er of tank	_	Mid-c	depth tflow	
Water Quality Samples:									
Sample Time:	Inflow	(NA)	_	Cente	er (NA)		Out へく		
Sampling Location:	Inflow	pipe			depth er of tank		Outflo	w pipe	
QA/QC Samples:	<u>Duplic</u>	cate		Equip	<u>. blank</u>		<u>No</u>	<u>ne</u>	
Location:	Infl Cntr	Outfl		1	IA				
Sample Time:						_			
Sample ID:	PP -	- W		PP -	- W				
Comments:									
Notetaker Signature:		-				····			

Field Sheet ENR South Test Cells Monitoring Periphyton-Based Stormwater Treatment Area (PSTA) Project

		148010.01.04.CH	
Monitoring Location:	Head Cell		Head-t
Type of Monitoring:	Weekly Me	onthly Quarterly	
Field Team:			(See page 1 unless otherwise noted)
Weather Conditions:			(See page 1 unless otherwise noted)
Date:			•
			.
Field Measurements:		Minisonde #	Total depth, ft:
	Surface	Mid-depth	⊕. ∜ v _u . ⊮ Bottom
Time:	12:10		
Sampling depth, ft:	- W		
Dissolved Oxygen, mg/L:	.0.46		
% DO Saturation:	. 5.5 .		
Temperature, °C:	22.70		
pH, SU:	7.89		
Conductivity, mS/cm:	1.376		<u> </u>
TDS, g/L	0.479		
Water Quality Samples:			
Sample Time:		_HT2: 1015 KT	321040
Sampling depth, ft:	EB1 - 1050		-
QA/QC Samples:	<u>Duplicate</u>	Equip. blank	<u>None</u>
Location:		NA NA	
Sample Time:			



FIELD INSTRUMENT CALIBRATION LOG

PROJECT 148010.P2.04/09.CH

MiniSonde 1 (Serial No. 35412)		MiniSonde 2 (Serial No. 35413)	
Pre-Calibration Readings	Post-Calibration Readings	Pre-Calibration Readings	Post-Calibration Readings
756 mg/l	D.O	D.O. 6.67 mg/	D.O. 6.33 mg/l
Temp 25	Temp°C	້ <u>ີເປັນ</u> Temp ຝ3.ໄລ ີ	्र
		SpCond 1.14 & ms/cm	SpCond COOL ms/cm
TempC	TempC	7.00 PH 7 7.00 PH 7	PH7 C.98
pH 10	pH 10	pH 10 9.63	PH 10 10.00
Temp°C	Temp°C	Тетр 23. Ц °С	Тетр а 3. 24 °С
MiniSonde 3 (Serial No. 35414)		MiniSonde 4 (Serial No. 35415)	
Pre-Calibration Readings	Post-Calibration Readings	Pre-Calibration Readings	Post-Calibration Readings
916	8	D.O	D.Omg/l
Temp 24.20	Temp 24. 56	D.O.%	
SpCond . 9 SpCond	SpCond L.OV ms/cm	Temp	Temp
Temp Temp 1. F.	Temp Temp Temp Temp Temp Temp Temp Temp	SpCond Temp "C	Spcondns/cm
PH 10 9 . S4	pH 10	PH 7	PH 7
Temp 26.1°S	Temp 24. P	pH 10°C	pH 10°C
MiniSonde 5 (Serial No. 35416) Signed:		Date: 02.19-0	-01

CHMHILL

PORTA-PSTA Inflow Calibration and Outflow Log

10618 Date:

All Inflows and Outflow Pipe Cleaned:

N PO Y

	Start	Staff	Outflow Reading	Actual Inflow	Flushed	Final Inflow	End	Final Outflow	Final Outflow	
Tank	Time	Gauge, In	(mL/min)	(mL/min)	(A/M)	(mL/min)	Time	(mL/min)	Time	Comments
-	0853	1170	700	730	>	048	0835			
2	032p	~(B)	001	०१ -		617	090			
ဗ	5050	-51	Coh	300		3,40	7090			
4	5050	ካ/ኒ ቲ/	3.50	363			Tobo	*		
5	acho	13-	S	20						
9	8060	とてい	CXK	014		240	3.63			
7	1160	-e\	500	647		700	2160			
8	2000	8/4 +	Soo	2017			4140			
6	5160	el (1	087	87		044	21/0			
10	0/1/0	१३३५५		780		OFF.	4150			
=	2/60	8/501	320	280		97	07/20			
12	Caltage !			cZ-,		00 h	2060			
13	tho	173/4	೦೨୯	210		390	4260			
14	0925	81+61	(40	C91		380	4260			
15	4760	12)	240	82		974	1860			
16	6932	133/4		360		3kg	. 4560			
17	6934	かなく		1		676	9560			
18	6937	13-	er.	585	y.	077	\$5 6 Q			
19	6938	€151	75/	9		390	W. J. S. S. S. S. S. S. S. S. S. S. S. S. S.	·		
20	52760	h/201	00/	e.).		674	4560			
21	55/50	-h	COE	OS E		CII	9569			
8	७ ९८४	M/ES	Chs	०५६		410	0158			
23	1001	15-12	0476	८०५		1190	1000			
24	0/0/	8 6€1	220	CO%	<u>ک</u>	ABEC T	2101			
						5				

Notetaker signature

Rev 1-5-00MS

FEBRUARY 12, 2001 PORTA-PSTA WEEKLY SAMPLING EVENT-WATER

PSTA

COC Number:	P261	ACT: HYTON-BASED STOR	WATER TRE	ATMENT AREA	Project HYTON-BASED STORWWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Kit Request ID:
Project #:	148010.01	CH Laboratory Coordi	oordinator:	Ellen P	Ellen Patterson / USA 954.426.6112 x233	
Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	Comments
P2-0793	PP-100T-W	021201 10:09	WA	+	TP_W	
P2-0794	PP-20UT-W		WA	-	TP_W	
P2-0795	PP-30UT-W	10:05	W	-	TP_W	
P2-0796	PP-40UT-W	01.3	Α¥	-	TP_W	
P2-0797	PP-50UT-W	10:10	Α×	-	W_TT_W	
P2-0798	PP-60UT-W	51:01	¥	-	TP_W	
P2-0799	PP-70UT-W	10:15	¥	-	W_qT	
P2-0800	PP-80UT-W	02:01	Α×	-	W_qT	
P2-0801	W-1006-44	90:01	ΑM	-	TP_W	
P2-0802	PP-100UT-W	10:01	۸۸	-	W_qT	
P2-0803	PP-110UT-W	21.01	¥	-	W_TP_W	
P2-0804	PP-120UT-W	51 :01	ΑW	-	TP_W	
P2-0805	PP-130UT-W	(0: 26	WA	1	TP_W	
P2-0806	PP-140UT-W	02:91	WA	-	TP_W	
P2-0807	PP-150UT-W	81:01	WA	1	TP_W	
P2-0808	PP-160UT-W	\$. io	WA	-	W_TP_W	
P2-0809	PP-170UT-W	પ્ર:જ	WA	-	W_qT	
P2-0810	PP-180UT-W	16:30	WA	-	W_TP_W	
P2-0811	PP-190UT-W	OC : 91	WA	-	W_qT	
P2-0812	PP-200UT-W	10:25	WA	1	TP_W	
P2-0813	PP-210UT-W	\$2.0I	WA	-	TP_W	
P2-0814	PP-220UT-W	12.01	WA	-	W_TP_W	
P2-0815	PP-230UT-W	02:01	WA	1	TP_W	
P2-0816	PP-240UT-W	07:01	WA	•	TP W	

Sampled By: TANA	*******************	Date / Time: のみへみひヽ		Custody Seal: Y (N)	Custody Seal: Y (N) Relinquished By:	Date / Time: クス/ラッ/
Shipped Via:	UPS FedEx Hand	Shipped Via: UPS FedEx Hand Other (please specify):				
Received By:		Date / Time:	Cooler Temp:	Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:
Received By:		Date / Time:	Cooler Temp:	Custody Seal: Y / N Relinquished By:	Relinquished By:	Date / Time:
Remarks:						

Generated on: 02/02/2001 4:44:40 PM

FEBRUARY 12, 2001 PORTA-PSTA WEEKLY SAMPLING EVENT- WATER

CH2M HILL Chain of Custody Form PSTA

Sample ID Station ID	1					
Stational Do UTA W	Date & Time	Matrix	Number of	Analysis Reguested	pelselo	Comments
	44. 4	ΑM	-	TP W		
		W	-	TP W		
-	10:40	WA	1	TP_W		
P2-0820 PP-FD1-W	10:50	WA	-	TP_W		
P2-0821 PP-FD2-W	no:01	WA	-	TP_W		
P2-0822 PP-FD3-W	10:35	WA	-	TP_W		
P2-0823 PP-EB1-W	10:01	W	1	TP_W		
P2-0824 PP-10UT-W	10:09	WA	-	TDP_W		
	60:01	W	-	TDP_W		
P2-0826 PP-30UT-W	8:0	W	-	TDP_W		
P2-0827 PP-40UT-W	0.0	WA	1	TDP_W		
P2-0828 PP-50UT-W	01;01	WA	1	TDP_W		
P2-0829 PP-60UT-W	. o	WA	-	TDP_W		
P2-0830 PP-70UT-W	10: 61 R	WA	-	TDP_W		
P2-0831 PP-80UT-W	07:01	WA	1	TDP_W		
P2-0832 PP-9OUT-W	10:01	WA	1	TDP_W		
P2-0833 PP-100UT-W	60:01	WA	1	TDP_W	and the second s	
P2-0834 PP-110UT-W	10:12	W	-	TDP_W		
P2-0835 PP-120UT-W	ξ. Ā	W	1	TDP_W		
P2-0836 PP-130UT-W	10:23	ΑW	-	W_dat		
P2-0837 PP-140UT-W	0; 50	WA	1	TDP_W		
P2-0838 PP-150UT-W	. O	WA	1	TDP_W		
P2-0839 PP-160UT-W	56:01	WA	-	TDP_W		
P2-0840 PP-17OUT-W	10:35	WA	1	TDP_W		
Sampled By:	Date / Time:			Custody Seal: Y / N	Relinquished By:	Date / Time:
Shipped Via: UPS FedEx Hand Oth	Other (please specify):					
	Date / Time:	Coole	Cooler Temp:	Custody Seal: Y / N	Relinquished By:	Date / Time:
Received By:	Date / Time:	Coole	Cooler Temp:	Custody Seal: Y / N	Relinquished By:	Date / Time:

FEBRUARY 12, 2001 PORTA-PSTA WEEKLY SAMPLING EVENT- WATER

Chain of Custody Form

PSTA

COC Number:	P261 Project:	HYTON-BASED STORM	NATER TRE	ATMENT ARE	Project: HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	EMONSTRATION PR	Kit Request ID:	
Project #:	148010.01.05.CH	Laboratory Coord	rdinator:	Ellen	Ellen Patterson / USA 954.426.6112 x233	.6112 x233	Lab: IFAS	
Sample ID	Station ID	Date & Time Collected	Matrix	Number of Containers	Analysis Requested	duested	Comments	ıts
P2-0841	≥	A5. 41. 1 (2) C. C.A	Α×	-	TDP W			
P2-0842	4-		W	-	TDP_W			
P2-0843	PP-200UT-W	10:25	WA	-	W_ddT	to the state of th		
P2-0844	PP-210UT-W	10.25	W	-	TDP_W			
P2-0845	PP-220UT-W	10;21	WA	-	TDP_W	and more which the state of the		
P2-0846	PP-230UT-W	92.91	W	-	TDP_W			
P2-0847	PP-240UT-W	3	W	-	TDP_W			
P2-0848	PP-HT1-W	8	W	-	TDP_W			
P2-0849	PP-HT2-W	7.0. R.	WA	-	TDP_W			
P2-0850	PP-HT3-W	Off: Ol	WA	-	TDP_W		1	
P2-0851	PP-FD1-W	10:50	WA	1	TDP_W			
P2-0852	PP-FD2-W	Ho:01	WA	-	TDP_W			
P2-0853	PP-FD3-W	10:36	WA	-	TDP_W			
P2-0854	PP-EB1-W	10:50	Š	-	TDP_W			
P2-0855	PP-10UT-W	60:01	WA	-	DRP			
P2-0856	PP-20UT-W	60.01	WA	-	DRP			
P2-0857	PP-30UT-W	50.01	WA	-	DRP			
P2-0858	PP-40UT-W	01:01	WA	-	DRP			
P2-0859	PP-50UT-W	10:10	W	-	DRP			
P2-0860	PP-60UT-W	10:15	W	-	DRP			
P2-0861	PP-70UT-W	\$1:01	WA	-	DRP			
P2-0862	PP-80UT-W	(0.20)	WA	-	DRP			
P2-0863	W-TUO6-AA	95:01	ΑM	-	DRP			
P2-0864	PP-100UT-W	10:09	WA	1	ОКР	***************************************		
Sampled By:		Date / Time:			Custody Seal: Y / N	Relinquished By:	Date /	Date / Time:
Shipped Via:	UPS FedEx Hand C	Other (please specify):						
Received By:		Date / Time:	Coole	Cooler Temp:	Custody Seal: Y / N	Relinquished By:	Date /	Date / Time:
Received By:		Date / Time:	Coole	Cooler Temp:	Custody Seal: Y / N	Relinquished By:	Date /	Date / Time:
Remarks:								

rptChainOfCustody - updated 981112

Generated on: 02/02/2001 4:45:01 PM

Chain of Custody Form CH2M HILL

ND DEMONSTRATION PR KIT Request ID:	954.426.6112 x233 Lab: IFAS	Analysis Requested Comments													The second secon										N Relinquished By: Date / Time:		N Relinquished By: Date / Time:	
Project: HYTON-BASED STORMWATER TREATMENT AREA (PSTA) RESEARCH AND DEMONSTRATION PR	Ellen Patterson / USA 95	Number of Containers Analy	1 DRP	1 DRP	1 DRP	1 DRP	1 DRP	1 DRP	1 DRP	1 DRP	1 DRP	1 DRP	1 DRP	1 DRP	1 DRP	1 DRP	1 DRP	1 DRP	1 DRP	1 DRP	1 DRP	1 DRP	1 DRP		Custody Seal: Y / N		emp: Custody Seal: Y / N	
STORMWATER TREATM	Laboratory Coordinator:	N Matrix C	WA	5 WA	WA	AW A	18 WA	35 WA	35 WA	WW &	NA WA	2.5 WA	z wA	Z WA	WA of	WA CC	W W	S WA	ηO WA	50 WA	AW Ho	35 WA	50 WQ			cify):	Cooler Temp:	
Project: HYTON-BASED	148010.01.05.CH Laborate	Date & Time Collected	JT-W 02120 10:12	V-10:15	JT-W 10: 20								JT-W 10:25		07.01 10.20					-W 10:50			W-10:50		Date / Time:	κ Hand Other (please specify):	Date / Time:	
	Project #: 148010.0	Sample ID Station ID	P2-0865 PP-110UT-W	P2-0866 PP-120UT-W	P2-0867 PP-130UT-W	P2-0868 PP-140UT-W	P2-0869 PP-150UT-W			P2-0872 PP-18OUT-W	P2-0873 PP-19OUT-W	P2-0874 PP-200UT-W				۵					P2-0883 PP-FD2-W	P2-0884 PP-FD3-W	P2-0885 PP-EB1-W		Sampled By:	Shipped Via: UPS FedEx	Received By:	0.000

Remarks:

PPB Lab Reports



March 29, 2001

Ms. Ellen Patterson CH2M Hill 800 Fairway Drive, Suite 350 Deerfield Beach, FL 33441

Dear Ms. Patterson:

Enclosed are the analytical results for your destructive project samples received February 16, 2001. Samples for Bulk Density and Percent Solids were analyzed by Law Engineering, Jacksonville, Florida (CQAP #950024).

All data were determined in accordance with published procedures (EPA-600/4-79-020, Methods for Chemical Analysis of Water and Wastes, Revised May 1983 and/or Standard Methods for the Examination of Water and Wastewater, 18th edition, revised 1992). Our laboratory is certified by the Florida Department of Health (FDH No. E82001) and our CQAP is approved by FDEP (No. 870017G).

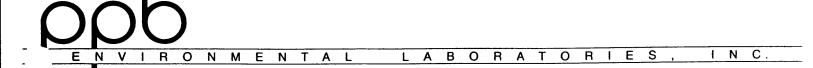
If you have any questions concerning this report, please contact me.

Sincerely,

Paul Berman Project Manager

PLB:cms

Enclosures



CH2M Hill Case Narrative

A number of samples for ash free dry weight are qualified with a Q code. This is due to the fact that the samples initially required wet weight and dry weight analysis. The ash free dry weight analysis was analyzed from the dried sample and thus the date of analysis for ash free dry weight, although listed as a separate analysis, should actually be considered to be the same date of analysis as for wet weight.

Please contact me if you have any questions regarding this report.

Sincerely,

Paul Berman

Project Manager

Paul Berm

900

ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

CH2M HILL

800 FAIRWAY DRIVE

SUITE 350

DEERFIELD BEACH, FL 33441-

Attn: MS ELLEN PATTERSON

DATE: 03/28/01 FDH # E82001

DEP CQAP # 870017G

YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 1 of 14)

CLIENT STATION ID	LAB NUMBER	%SOLIDS %	g MET MEIGHT	DRY WEIGHT	AFDW mg/L	BLK DNSTY G/CC	CA/T/ICP mg/L
PP-3-BP1	202489	N.R.	N.R.	N.R.	12800	N.R.	14200
PP-3-BP2	202490	N.R.	N.R.	N.R.	11800	N.R.	9560
PP-5-BP1	202491	N.R.	N.R.	N.R.	13900	N.R.	7670
PP-5-BP2	202492	N.R.	N.R.	N.R.	15600	N.R.	14900
PP-10-BP1	202493	N.R.	N.R.	N.R.	12400	N.R.	9500
PP-10-BP2	202494	N.R.	N.R.	N.R.	13900	N.R.	8960
PP-14-BP1	202495	N.R.	N.R.	N.R.	26800	N.R.	3830
PP-14-BP2	202496	N.R.	N.R.	N.R.	23500	N.R.	2260
PP-17-BP1	202497	N.R.	N.R.	N.R.	42900	N.R.	4990
PP-17-BP2	202498	N.R.	N.R.	N.R.	38200	N.R.	5620
PP-19-BP1	202499	N.R.	N.R.	N.R.	9590	N.R.	8260
PP-19-BP2	202500	N.R.	N.R.	N.R.	9860	N.R.	11200
PP-EB1-BP	202501	N.R.	N.R.	N.R.	12 U	N.R.	0.14
PP-EB2-BP	202502	N.R.	N.R.	N.R.	12 U	N.R.	0.14
PP-3-FP1	202503	N.R.	N.R.	N.R.	10800	N.R.	11700
PP-3-FP2	202504	N.R.	N.R.	N.R.	7660	N.R.	7800
PP-5-FP1	202505	N.R.	N.R.	N.R.	10800	N.R.	10200
PP-5-FP6	202506	N.R.	N.R.	N.R.	11000	N.R.	10600
PP-10-FP1	202507	N.R.	N.R.	N.R.	8940	N.R.	776 0
PP-10-FP2	202508	N.R.	N.R.	N.R.	9480	N.R.	9950
PP-14-FP1	202509	N.R.	N.R.	N.R.	15000	N.R.	6650
PP-14-FP2	202510	N.R.	N.R.	N.R.	13200	N.R.	2310
PP-17-FP1	202511	N.R.	N.R.	N.R.	4390	N.R.	2090
PP-17-FP2	202512	N.R.	N.R.	N.R.	3740	N.R.	3530

U = Result below detection limit BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED

PROJECT MANAGER

Paul Bermm

IRONMENTAL LABORATORIES

REPORT OF ANALYSES

CH2M HILL

800 FAIRWAY DRIVE

SUITE 350

DEERFIELD BEACH, FL 33441-Attn: MS ELLEN PATTERSON

DATE: 03/28/01 FDH # E82001

DEP CQAP # 870017G YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 2 of 14)

CLIENT		LAB	CA/S/ICP
STATION	ID	NUMBER	mg/kg
PP-3-BP1		202489	N.R.
PP-3-BP2		202490	N.R.
PP-5-BP1		202491	N.R.
PP-5-BP2		202492	N.R.
PP-10-BP1		202493	N.R.
PP-10-BP2		202494	N.R.
PP-14-BP1		202495	N.R.
PP-14-BP2		202496	N.R.
PP-17-BP1		202497	N.R.
PP-17-BP2		202498	N.R.
PP-19-BP1		202499	N.R.
PP-19-BP2		202500	N.R.
PP-EB1-BP		202501	N.R.
PP-EB2-BP		202502	N.R.
PP-3-FP1		202503	N.R.
PP-3-FP2		202504	N.R.
PP-5-FP1		202505	N.R.
PP-5-FP6		202506	N.R.
PP-10-FP1		202507	N.R.
PP-10-FP2		202508	N.R.
PP-14-FP1		202509	N.R.
PP-14-FP2		202510	N.R.
PP-17-FP1		202511	N.R.
PP-17-FP2		202512	N.R.

BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED

PROJECT MANAGER



REPORT OF ANALYSES

CH2M HILL

800 FAIRWAY DRIVE

SUITE 350

DEERFIELD BEACH, FL 33441-

Attn: MS ELLEN PATTERSON

DATE: 03/28/01 FDH # E82001

DEP CQAP # 870017G YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 3 of 14)

CLIENT STATION ID	LAB NUMBER	%SOLIDS %	g WET WEIGHT	DRY WEIGHT	AFDW mg/L	BLK DNSTY G/CC	CA/T/ICP mg/L
PP-EB1-FP	202513	N.R.	N.R.	N.R.	12 U	N.R.	0.40
PP-EB2-FP	202514	N.R.	N.R.	N.R.	12 U	N.R.	0.36
PP-3-WP1	202515	N.R.	N.R.	N.R.	14100	N.R.	12600
PP-3-WP2	202516	N.R.	N.R.	N.R.	12500	N.R.	26900
PP-5-WP1	202517	N.R.	N.R.	N.R.	11000	N.R.	12600
PP-5-WP2	202518	N.R.	N.R.	N.R.	13300	N.R.	11800
PP-10-WP1	202519	N.R.	N.R.	N.R.	18600	N.R.	16200
PP-10-WP2	202520	N.R.	N.R.	N.R.	16800	N.R.	17400
PP-12-WP1	202521	N.R.	N.R.	N.R.	9440	N.R.	7520
PP-12-WP2	202522	N.R.	N.R.	N.R.	11900	N.R.	11200
PP-14-WP1	202523	N.R.	N.R.	N.R.	23300	N.R.	9680
PP-14-WP2	202524	N.R.	N.R.	N.R.	21900	N.R.	9520
PP-17-WP1	202525	N.R.	N.R.	N.R.	6610	N.R.	2250
PP-17-WP2	202526	N.R.	N.R.	N.R.	14400	N.R.	11400
PP-19-WP1	202527	N.R.	N.R.	N.R.	17000	N.R.	18200
PP-19-WP2	202528	N.R.	N.R.	N.R.	16700	N.R.	15800
PP-20-WP2	202529	N.R.	N.R.	N.R.	778	N.R.	422
PP-FD1-WP2	202530	N.R.	N.R.	N.R.	676	N.R.	301
PP-EB1-WP	202531	N.R.	N.R.	N.R.	12 U	N.R.	0.44
PP-EB2-WP	202532	N.R.	N.R.	N.R.	12 U	N.R.	0.24
PP-3-CON	202533	N.R.	10.1545	0.3934 I	12000	N.R.	2920
PP-5-CON	202534	N.R.	10.110	0.1417 I	5090	N.R.	851
PP-10-CON	202535	N.R.	10.041	0.1518 I	9220	N.R.	2500
PP-12-CON	202536	N.R.	10.1690	0.6564	55800	N.R.	11000

I = Result between detection limit and practical quantitation limit

BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED

U = Result below detection limit

006

ENVIRONMENTAL LABORATORIES, INC

REPORT OF ANALYSES

CH2M HILL

800 FAIRWAY DRIVE

SUITE 350

DEERFIELD BEACH, FL 33441-

Attn: MS ELLEN PATTERSON

DATE: 03/28/01 FDH # E82001

DEP CQAP # 870017G YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 4 of 14)

CLIENT STATION	ID	LAB NUMBER	CA/S/ICP mg/kg
PP-EB1-FP		202513	N.R.
PP-EB2-FP		202514	N.R.
PP-3-WP1		202515	N.R.
PP-3-WP2		202516	N.R.
PP-5-WP1		202517	N.R.
PP-5-WP2		202518	N.R.
PP-10-WP1		202519	N.R.
PP-10-WP2		202520	N.R.
PP-12-WP1		202521	N.R.
PP-12-WP2		202522	N.R.
PP-14-WP1		202523	N.R.
PP-14-WP2		202524	N.R.
PP-17-WP1		202525	N.R.
PP-17-WP2		202526	N.R.
PP-19-WP1		202527	N.R.
PP-19-WP2		202528	N.R.
PP-20-WP2		202529	N.R.
PP-FD1-WP2		202530	N.R.
PP-EB1-WP		202531	N.R.
PP-EB2-WP		202532	N.R.
PP-3-CON		202533	N.R.
PP-5-CON		202534	N.R.
PP-10-CON		202535	N.R.
PP-12-CON		202536	N.R.

I = Result between detection limit and practical quantitation limit BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED

PROJECT MANAGER

6821 SW ARCHER ROAD, GAINESVILLE, FL 32608 (352) 377-2349 Fax (352) 395-6639 ppb@ppb-envlabs.com

Paul Berm



REPORT OF ANALYSES

CH2M HILL

800 FAIRWAY DRIVE

SUITE 350

DEERFIELD BEACH, FL 33441-

Attn: MS ELLEN PATTERSON

DATE: 03/28/01 FDH # E82001

DEP CQAP # 870017G

YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 5 of 14)

CLIENT STATION ID	LAB NUMBER	%SOLIDS %	WET WEIGHT	DRY WEIGHT	AFDW mg/L	BLK DNSTY G/CC	CA/T/ICP mg/L
PP-14-CON	202537	N.R.	9.9840	0.0878 I	7870	N.R.	1530
PP-17-CON	202538	N.R.	10.2725	0.5228	8260	N.R.	1500
PP-19-CON	202539	N.R.	10.044	0.3930 I	21400	N.R.	7100
PP-20-CON	202540	N.R.	9.929	0.0685 I	3080	N.R.	1180
PP-21-CON	202541	N.R.	11.266 Q	1.7609 Q	20000	N.R.	11500
PP-22-CON	202542	N.R.	10.707 Q	1.3498 Q	32100	N.R.	16500
PP-FD1-CON	202543	N.R.	10.455	0.8584	50800	N.R.	1240
PP-3-UPR1	202544	69.6	N.R.	N.R.	N.R.	1.18	N.R.
PP-3-UPR2	202545	71.2	N.R.	N.R.	N.R.	1.50	N.R.
PP-5-UPR1	202546	74.7	N.R.	N.R.	N.R.	1.36	N.R.
PP-5-UPR2	202547	72.2	N.R.	N.R.	N.R.	1.30	N.R.
PP-10-UPR1	202548	63.3	N.R.	N.R.	N.R.	1.44	N.R.
PP-10-UPR2	202549	62.0	N.R.	N.R.	N.R.	1.48	N.R.
PP-12-UPR1	202550	27.6	N.R.	N.R.	N.R.	0.38 I	N.R.
PP-12-UPR2	202551	21.6	N.R.	N.R.	N.R.	0.28 I	N.R.
PP-14-UPR1	202552	23.4	N.R.	N.R.	N.R.	0.33 I	N.R.
PP-14-UPR2	202553	38.2	N.R.	N.R.	N.R.	0.33 I	N.R.
PP-17-UPR1	202554	36.4	N.R.	N.R.	N.R.	0.30 I	N.R.
PP-17-UPR2	202555	22.7	N.R.	N.R.	N.R.	0.29 I	N.R.
PP-19-UPR1	202556	73.9	N.R.	N.R.	N.R.	1.32	N.R.
PP-19-UPR2	202557	73.0	N.R.	N.R.	N.R.	1.34	N.R.
PP-20-UPR1	202558	83.4	N.R.	N.R.	N.R.	1.39	N.R.
PP-20-UPR2	202559	83.0	N.R.	N.R.	N.R.	1.28	N.R.
PP-FD1-UPR	202560	73.8	N.R.	N.R.	N.R.	1.36	N.R.

I = Result between detection limit and practical quantitation limit

BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED

Q = Result analyzed out of holding time



REPORT OF ANALYSES

CH2M HILL

800 FAIRWAY DRIVE

SUITE 350

DEERFIELD BEACH, FL 33441-Attn: MS ELLEN PATTERSON DATE: 03/28/01 FDH # E82001

DEP CQAP # 870017G YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 6 of 14)

CLIENT	LAB	CA/S/ICE
STATION ID	NUMBER	mg/kg
PP-14-CON	202537	N.R.
PP-17-CON	202538	N.R.
PP-19-CON	202539	N.R.
PP-20-CON	202540	N.R.
PP-21-CON	202541	N.R.
PP-22-CON	202542	N.R.
PP-FD1-CON	202543	N.R.
PP-3-UPR1	202544	126000
PP-3-UPR2	202545	163000
PP-5-UPR1	202546	174000
PP-5-UPR2	202547	130000
PP-10-UPR1	202548	142000
PP-10-UPR2	202549	128000
PP-12-UPR1	202550	8790
PP-12-UPR2	202551	131000
PP-14-UPR1	202552	20200
PP-14-UPR2	202553	295000
PP-17-UPR1	202554	258000
PP-17-UPR2	202555	69800
PP-19-UPR1	202556	5790
PP-19-UPR2	202557	5400
PP-20-UPR1	202558	569
PP-20-UPR2	202559	678
PP-FD1-UPR	202560	5420

I = Result between detection limit and practical quantitation limit BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED

PROJECT MANAGER



REPORT OF ANALYSES

CH2M HILL

800 FAIRWAY DRIVE

SUITE 350

DEERFIELD BEACH, FL 33441-

Attn: MS ELLEN PATTERSON

DATE: 03/28/01 FDH # E82001

DEP CQAP # 870017G

YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 7 of 14)

CLIENT STATION ID	LAB NUMBER	%SOLIDS %	WET WEIGHT g	DRY WEIGHT g	AFDW mg/L	BLK DNSTY G/CC	CA/T/ICP mg/L
PP-FD2-UPR	202561	71.7	N.R.	N.R.	N.R.	1.18	N.R.
PP-EB1-UPR	202562	N.R.	N.R.	N.R.	N.R.	N.R.	0.04 I
PP-EB2-UPR	202563	N.R.	N.R.	N.R.	N.R.	N.R.	0.02 I
PP-19-FP1	202564	N.R.	N.R.	N.R.	7110	N.R.	7550
PP-19-FP2	202565	N.R.	N.R.	N.R.	10700	N.R.	6010
PP-20-FP1	202566	N.R.	N.R.	N.R.	11400	N.R.	9460
PP-20-FP2	202567	N.R.	N.R.	N.R.	11600	N.R.	8900
PP-21-FP1	202568	N.R.	N.R.	N.R.	10300	N.R.	8990
PP-21-FP2	202569	N.R.	N.R.	N.R.	11400	N.R.	10600
PP-22-FP1	202570	N.R.	N.R.	N.R.	10300	N.R.	8700
PP-22-FP2	202571	N.R.	N.R.	N.R.	10200	N.R.	8810
PP-FD1-FP	202572	N.R.	N.R.	N.R.	7120	N.R.	5810
PP-FD2-FP	202573	N.R.	N.R.	N.R.	7470	N.R.	6440
PP-20-WP1	202574	N.R.	N.R.	N.R.	2290	N.R.	1260
PP-21-WP1	202575	N.R.	N.R.	N.R.	9600	N.R.	8760
PP-21-WP2	202576	N.R.	N.R.	N.R.	9840	N.R.	9340
PP-22-WP1	202577	N.R.	N.R.	N.R.	4320	N.R.	4160
PP-22-WP2	202578	N.R.	N.R.	N.R.	7950	N.R.	7660
PP-FD2-WP	202579	N.R.	N.R.	N.R.	4360	N.R.	4320
PP-20-BP1	202580	N.R.	N.R.	N.R.	7570	N.R.	4530
PP-20-BP2	202581	N.R.	N.R.	N.R.	8760	N.R.	5240
PP-21-BP1	202582	N.R.	N.R.	N.R.	11000	N.R.	9080
PP-21-BP2	202583	N.R.	N.R.	N.R.	8440	N.R.	8540
PP-22-BP1	202584	N.R.	N.R.	N.R.	8350	N.R.	9340

I = Result between detection limit and practical quantitation limit BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED

PROJECT MANAGER

Paul Berm



LABORATORIES, IRONMENTAL

REPORT OF ANALYSES

CH2M HILL

800 FAIRWAY DRIVE

SUITE 350

DEERFIELD BEACH, FL 33441-

Attn: MS ELLEN PATTERSON

DATE: 03/28/01 FDH # E82001

DEP CQAP # 870017G YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 8 of 14)

CLIENT	LAB	CA/S/IC
STATION ID	NUMBER	mg/kg
PP-FD2-UPR	202561	243000
PP-EB1-UPR	202562	N.R.
PP-EB2-UPR	202563	N.R.
PP-19-FP1	202564	N.R.
PP-19-FP2	202565	N.R.
PP-20-FP1	202566	N.R.
PP-20-FP2	202567	N.R.
PP-21-FP1	202568	N.R.
PP-21-FP2	202569	N.R.
PP-22-FP1	202570	N.R.
PP-22-FP2	202571	N.R.
PP-FD1-FP	202572	N.R.
PP-FD2-FP	202573	N.R.
PP-20-WP1	202574	N.R.
PP-21-WP1	202575	N.R.
PP-21-WP2	202576	N.R.
PP-22-WP1	202577	N.R.
PP-22-WP2	202578	N.R.
PP-FD2-WP	202579	N.R.
PP-20-BP1	202580	N.R.
PP-20-BP2	202581	N.R.
PP-21-BP1	202582	N.R.
PP-21-BP2	202583	N.R.
PP-22-BP1	202584	N.R.

I = Result between detection limit and practical quantitation limit BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED

PROJECT MANAGER

6821 SW ARCHER ROAD, GAINESVILLE, FL 32608 (352) 377-2349 Fax (352) 395-6639 ppb@ppb-envlabs.com



REPORT OF ANALYSES

CH2M HILL

800 FAIRWAY DRIVE

SUITE 350

DEERFIELD BEACH, FL 33441-

Attn: MS ELLEN PATTERSON

DATE: 03/28/01 FDH # E82001

DEP CQAP # 870017G YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 9 of 14)

CLIENT STATION ID	LAB NUMBER	%SOLIDS	WET WEIGHT	DRY WEIGHT	AFDW mg/L	BLK DNSTY G/CC	CA/T/ICP mg/L
			,	3	3,	•	3.
							0.5.77.0
PP-22-BP2	202585	N.R.	N.R.	N.R.	8250	N.R.	8170
PP-FD1-BP	202586	N.R.	N.R.	N.R.	8950	N.R.	4600
PP-3-LRW1	202587	85.4	N.R.	N.R.	N.R.	1.40	N.R.
PP-3-LRW2	202588	82.7	N.R.	N.R.	N.R.	1.43	N.R.
PP-5-LRW1	202589	82.6	N.R.	N.R.	N.R.	1.57	N.R.
PP-5-LRW2	202590	79.5	N.R.	N.R.	N.R.	1.60	N.R.
PP-10-LRW1	202591	76.3	N.R.	N.R.	N.R.	1.26	N.R.
PP-10-LRW2	202592	67.5	N.R.	N.R.	N.R.	1.42	N.R.
PP-12-LRW1	202593	26.6	N.R.	N.R.	N.R.	0.42	N.R.
PP-12-LRW2	202594	27.0	N.R.	N.R.	N.R.	0.41	N.R.
PP-14-LRW1	202595	27.9	N.R.	N.R.	N.R.	0.41	N.R.
PP-14-LRW2	202596	22.6	N.R.	N.R.	N.R.	0.41	N.R.
PP-17-LRW1	202597	28.0	N.R.	N.R.	N.R.	0.41	N.R.
PP-17-LRW2	202598	37.2	N.R.	N.R.	N.R.	0.40 I	N.R.
PP-19-LRW1	202599	81.0	N.R.	N.R.	N.R.	1.48	N.R.
PP-19-LRW2	202600	80.8	N.R.	N.R.	N.R.	1.53	N.R.
PP-20-LRW1	202601	79.5	N.R.	N.R.	N.R.	1.59	N.R.
PP-20-LRW2	202602	80.9	N.R.	N.R.	N.R.	1.57	N.R.
PP-FD1-LWR1	202603	81.0	N.R.	N.R.	N.R.	1.60	N.R.
PP-FD2-LWR	202604	81.6	N.R.	N.R.	N.R.	1.36	N.R.
PP-FD2-BP	202606	N.R.	N.R.	N.R.	7790	N.R.	5550
PP-FD3-LWR	202607	68.3	N.R.	N.R.	N.R.	1.30	N.R.
PP-EB1-LWR	202608	N.R.	N.R.	N.R.	N.R.	N.R.	0.02 I
PP-EB2-LWR	202609	N.R.	N.R.	N.R.	N.R.	N.R.	0.20

I = Result between detection limit and practical quantitation limit BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED

PROJECT MANAGER

Paul Bermu



LABORATORIES, NMENTAL

REPORT OF ANALYSES

CH2M HILL

800 FAIRWAY DRIVE

SUITE 350

DEERFIELD BEACH, FL 33441-

Attn: MS ELLEN PATTERSON

DATE: 03/28/01 FDH # E82001

DEP CQAP # 870017G

YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 10 of 14)

CLIENT	T D	LAB	CA/S/ICP
STATION	ID	NUMBER	mg/kg
PP-22-BP2		202585	N.R.
PP-FD1-BP		202586	N.R.
PP-3-LRW1		202587	144000
PP-3-LRW2		202588	153000
PP-5-LRW1		202589	193000
PP-5-LRW2		202590	164000
PP-10-LRW1		202591	162000
PP-10-LRW2		202592	167000
PP-12-LRW1		202593	111000
PP-12-LRW2		202594	124000
PP-14-LRW1		202595	94700
PP-14-LRW2		202596	90700
PP-17-LRW1		202597	174000
PP-17-LRW2		202598	93200
PP-19-LRW1		202599	630
PP-19-LRW2		202600	563
PP-20-LRW1		202601	508
PP-20-LRW2		202602	1180
PP-FD1-LWR	L	202603	1060
PP-FD2-LWR		202604	168000
PP-FD2-BP		202606	N.R.
PP-FD3-LWR		202607	206000
PP-EB1-LWR		202608	N.R.
PP-EB2-LWR		202609	N.R.

I = Result between detection limit and practical quantitation limit BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED



REPORT OF ANALYSES

CH2M HILL

800 FAIRWAY DRIVE

SUITE 350

DEERFIELD BEACH, FL 33441-

Attn: MS ELLEN PATTERSON

DATE: 03/28/01 FDH # E82001

DEP CQAP # 870017G

YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 11 of 14)

CLIENT STATION ID	LAB NUMBER	%SOLIDS %	WET WEIGHT	DRY WEIGHT	AFDW mg/g	BLK DNSTY G/CC	CA/T/ICP mg/L
PP-3-MAC1	202619	N.R.	75.950	10.389	843 Q	N.R.	N.R.
PP-3-MAC2	202620	N.R.	85.250	11.020	844 Q	N.R.	N.R.
PP-5-MAC1	202621	N.R.	96.425	16.262	856 Q	N.R.	N.R.
PP-5-MAC2	202622	N.R.	84.589	19.801	885 Q	N.R.	N.R.
PP-10-MAC1	202623	N.R.	94.796	17.223	887 Q	N.R.	N.R.
PP-10-MAC2	202624	N.R.	65.281	13.386	868 Q	N.R.	N.R.
PP-12-MAC1	202625	N.R.	83.726	21.159	899 Q	N.R.	N.R.
PP-12-MAC2	202626	N.R.	102.311	24.654	888 Q	N.R.	N.R.
PP-14-MAC1	202627	N.R.	120.243	14.388	906 Q	N.R.	N.R.
PP-14-MAC2	202628	N.R.	176.419	20.109	898 Q	N.R.	N.R.
PP-17-MAC1	202629	N.R.	130.318	16.390	879 Q	N.R.	N.R.
PP-17-MAC2	202630	N.R.	97.862	15.893	897 Q	N.R.	N.R.
PP-19-MAC1	202631	N.R.	103.717	20.882	883 Q	N.R.	N.R.
PP-19-MAC2	202632	N.R.	107.342	23.175	881 Q	N.R.	N.R.
PP-20-MAC1	202633	N.R.	67.501	15.542	727 Q	N.R.	N.R.
PP-20-MAC2	202634	N.R.	43.066	11.125	883 Q	N.R.	N.R.
PP-FD1-MAC	202635	N.R.	113.593	20.262	794 Q	N.R.	N.R.
PP-FD2-MAC	202636	N.R.	67.827	10.403	867 Q	N.R.	N.R.
PP-3-RTS1	202637	N.R.	106.322	20.008	353 Q	N.R.	N.R.
PP-3-RTS2	202638	N.R.	107.783	13.503	490 Q	N.R.	N.R.
PP-5-RTS1	202639	N.R.	123.976	17.362	628 Q	N.R.	N.R.
PP-5-RTS2	202640	N.R.	79.989	12.223	783 Q	N.R.	N.R.
PP-10-RTS1	202641	N.R.	10.958	13.462	746 Q	N.R.	N.R.
PP-10-RTS2	202642	N.R.	209.471	27.128	861 Q	N.R.	N.R.

I = Result between detection limit and practical quantitation limit

BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED

Q = Result analyzed out of holding time



REPORT OF ANALYSES

CH2M HILL

800 FAIRWAY DRIVE

SUITE 350

DEERFIELD BEACH, FL 33441-

Attn: MS ELLEN PATTERSON

DATE: 03/28/01 FDH # E82001

DEP CQAP # 870017G YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 12 of 14)

CLIENT STATION ID	LAB NUMBER	CA/S/ICE mg/kg
DIMITON ID	NOMBER	mg/ kg
PP-3-MAC1	202619	26400
PP-3-MAC2	202620	17700
PP-5-MAC1	202621	23500
PP-5-MAC2	202622	7040
PP-10-MAC1	202623	11900
PP-10-MAC2	202624	16600
PP-12-MAC1	202625	5550
PP-12-MAC2	202626	5500
PP-14-MAC1	202627	5140
PP-14-MAC2	202628	5600
PP-17-MAC1	202629	11500
PP-17-MAC2	202630	7090
PP-19-MAC1	202631	4520
PP-19-MAC2	202632	6330
PP-20-MAC1	202633	15000
PP-20-MAC2	202634	7050
PP-FD1-MAC	202635	17200
PP-FD2-MAC	202636	15100
PP-3-RTS1	202637	84200
PP-3-RTS2	202638	138000
PP-5-RTS1	202639	67300
PP-5-RTS2	202640	26700
PP-10-RTS1	202641	31200
PP-10-RTS2	202642	14400

I = Result between detection limit and practical quantitation limit BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED

PROJECT MANAGER

6821 SW ARCHER ROAD, GAINESVILLE, FL 32608 (352) 377-2349 Fax (352) 395-6639 ppb@ppb-envlabs.com



REPORT OF ANALYSES

CH2M HILL

800 FAIRWAY DRIVE

SUITE 350

DEERFIELD BEACH, FL 33441-

Attn: MS ELLEN PATTERSON

DATE: 03/28/01 FDH # E82001

DEP CQAP # 870017G

YOUR REF/P.O.: 148010

SAMPLES RECEIVED 2/16/01 (Page 13 of 14)

CLIENT STATION ID	LAB NUMBER	%SOLIDS %	WET WEIGHT	DRY WEIGHT	AFDW mg/g	BLK DNSTY G/CC	CA/T/ICP mg/L
PP-12-RTS1	202643	N.R.	87.322	13.318	902 0	N.R.	N.R.
PP-12-RTS2	202644	N.R.	125.985	17.832	917 Q	N.R.	N.R.
PP-14-RTS1	202645	N.R.	137.003	15.580	855 Q	N.R.	N.R.
PP-14-RTS2	202646	N.R.	144.146	13.846	899 Q	N.R.	N.R.
PP-17-RTS1	202647	N.R.	91.801	10.833	883 Q	N.R.	N.R.
PP-17-RTS2	202648	N.R.	86.706	9.428	864 Q	N.R.	N.R.
PP-19-RTS1	202649	N.R.	121.826	15.119	870 Q	N.R.	N.R.
PP-19-RTS2	202650	N.R.	126.976	14.774	886 Q	N.R.	N.R.
PP-20-RTS1	202651	N.R.	97.403	14.918	855 Q	N.R.	N.R.
PP-20-RTS2	202652	N.R.	130.904	19.373	792 Q	N.R.	N.R.
PP-FD1-RTS	202653	N.R.	136.734	19.069	866 Q	N.R.	N.R.
PP-FD2-RTS	202654	N.R.	118.075	27.311	261 Q	N.R.	N.R.

I = Result between detection limit and practical quantitation limit

Q = Result analyzed out of holding time

BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED

PROJECT MANAGER



REPORT OF ANALYSES

CH2M HILL

800 FAIRWAY DRIVE

SUITE 350

DEERFIELD BEACH, FL 33441-

Attn: MS ELLEN PATTERSON

DATE: 03/28/01 FDH # E82001

DEP CQAP # 870017G

YOUR REF/P.O.: 148010

Paul Bern

SAMPLES RECEIVED 2/16/01 (Page 14 of 14)

CLIENT	LAB	CA/S/ICP
STATION ID	NUMBER	mg/kg
PP-12-RTS1	202643	4460
PP-12-RTS2	202644	4830
PP-14-RTS1	202645	12600
PP-14-RTS2	202646	10100
PP-17-RTS1	202647	4340
PP-17-RTS2	202648	8360
PP-19-RTS1	202649	5440
PP-19-RTS2	202650	5760
PP-20-RTS1	202651	8220
PP-20-RTS2	202652	6900
PP-FD1-RTS	202653	17800
PP-FD2-RTS	202654	127000

I = Result between detection limit and practical quantitation limit BUYER V WIDGREN

NOTE: N. R. = ANALYSIS NOT REQUIRED

PROJECT MANAGER



LABORATORIES Ν М ENTA L

QC REPORT FOR CH2M HILL 03/28/01 PAGE 1

TOTAL SOLIDS

Method: EPA 160.3 Alt. Method: None so

Duplicates

Value 1 Value 2 Range % RSD QC Control Limit PPB Number Client ID 202552 23.0 23.7 0.70 2.12 10.99 PP-14-UPR1 82.8 87.9 5.1 4.23 3.90 202587 PP-3-LRW1 11.01 202597 PP-17-LRW1 28.7 27.3 1.4 3.54 202607 PP-FD3-LWR 63.7 72.9 9.2 9.52 11.04

NO SPIKE QC DATA FOUND

NO REFERENCE QC DATA FOUND

TOTAL WET WEIGHT

g

WA

Method: SM 2540B Alt. Method: None

NO DUPLICATE QC DATA FOUND

NO SPIKE QC DATA FOUND

NO REFERENCE QC DATA FOUND

TOTAL WET WEIGHT

g

VG

Method: SM 2540B Alt. Method: None

NO DUPLICATE QC DATA FOUND

NO SPIKE QC DATA FOUND

NO REFERENCE QC DATA FOUND



LABORATORIES, INC. Ν

QC REPORT FOR CH2M HILL 03/28/01 PAGE 2

TOTAL DRY WEIGHT

g

WA

Method: SM 2540B Alt. Method: None

Duplicates

PPB Number Client ID

Value 1 Value 2 Range % RSD QC Control Limit

202533 PP-3-CON 202538 PP-17-CON

0.5188 0.2680 0.5895 0.4562 0.25 45.08 0.13 18.03 NO DATA NO DATA

NO SPIKE QC DATA FOUND

NO REFERENCE QC DATA FOUND

TOTAL DRY WEIGHT

VG

Method: SM 2540B Alt. Method: None

NO DUPLICATE QC DATA FOUND

NO SPIKE QC DATA FOUND

NO REFERENCE QC DATA FOUND

ASH FREE DRY WEIGHT

mg/L

WA

8920

8312

310

132

2.50

1.13

38.66

35.77

Method: SM10300D Alt. Method: None

Duplicates

202581

202585

PPB Number	Client ID	Value 1	Value 2	Range	% RSD	QC Control Limit
202498	PP-17-BP2	37500	38900	1400	2.59	42.45
20 2508	PP-10-FP2	8370	10600	2230	16.62	40.89
202518	PP-5-WP2	13000	13600	600	3.19	41.02
202529	PP-20-WP2	779	776	3.0	0.27	32.22
202542	PP-22-CON	32400	31800	600	1.32	36.63
202572	PP-FD1-FP	7080	7150	70	0.70	39.72

8610

8180

NO SPIKE QC DATA FOUND

NO REFERENCE QC DATA FOUND

PP-20-BP2

PP-22-BP2



LABORATORIES, MENTAL

QC REPORT FOR CH2M HILL 03/28/01 PAGE 3

Blank Concentration Analytical Batch # Sample Numbers in Batch

<12	46512	202489-202543,	202564-202586,	202606,
<12	46512	202489-202543,	202564-202586,	202606,
<12	46512	202489-202543.	202564-202586	202606.

ASH FREE DRY WEIGHT

mg/L

VG Method: SM10300D Alt. Method: None

Duplicates

PPB Number Client ID Value 1 Value 2 Range % RSD QC Control Limit

202628	PP-14-MAC2	900	897	3.0	0.24	40.97
202638	PP-3-RTS2	526	454	72	10.39	36.57
202648	PP-17-RTS2	864	864	0	0.00	32.25
202652	PP-20-RTS2	856	729	127	11.33	30.33

NO SPIKE QC DATA FOUND

NO REFERENCE QC DATA FOUND

Blanks

Blank Concentration Analytical Batch # Sample Numbers in Batch

<12	46703	202619-202654,	
<12	46703	202619-202654,	

ENVIRONMENTAL LABORATORIES, INC.

QC REPORT FOR CH2M HILL 03/28/01 PAGE 4

BULK DRY DENSITY

G/CC

SO Method: BULK DNSTY Alt. Method: None

NO DUPLICATE QC DATA FOUND

NO SPIKE QC DATA FOUND

NO REFERENCE QC DATA FOUND

CALCIUM, TOTAL

mg/L

WA Method: EPA 200.7 Alt. Method: EPA 6010

PPB Number	Client ID	Value :	l Value 2	2 Range	% RSD	QC Control L:	imit
202489	PP-3-BP1	14300	14100	200	1.00	7.80	
202499	PP-19-BP1	8370	8150	220	1.88	7.82	
202519	PP-10-WP1	16600	15700	900	3.94	7.72	
202529	PP-20-WP2	428	416	12	2.01	7.80	
202539	PP-19-CON	7530	6670	860	8.56	7.13	
202567	PP-20-FP2	9110	8680	430	3.42	7.97	
202576	PP-21-WP2	9310	9380	70	0.53	7.65	
202586	PP-FD1-BP	4590	4600	10	0.15	7.54	
202608	PP-EB1-LWR	0.03	<0.02	0.020	70.71	NO DATA	

Spikes

ppzkea			Spike Recovery	% RSD
PPB Number Client ID	% MS	% MSD		RSD Control Limit

202490	PP-3-BP2	99	 65 TO 128	
202500	PP-19-BP2	106	 66 TO 128	
202510	PP-14-FP2	108	 68 TO 128	
202520	PP-10-WP2	103	 68 TO 128	
202530	PP-FD1-WP2	91.	 65 TO 127	
202530	PP-FD1-WP2	108	 65 TO 127	
202540	PP-20-CON	105	 68 TO 127	
202564	PP-19-FP1	107	 68 TO 127	
202569	PP-21-FP2	107	 68 TO 127	
202578	PP-22-WP2	111	 69 TO 126	

VIRONMENTAL LABORATORIES, INC.

QC REPORT FOR CH2M HILL 03/28/01 PAGE 5

Spi	kes
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PPB Number	Client ID		Spike Recovery % RSD % MS % MSD Control Limits RSD Control Limit
202582 202609 202609	PP-21-BP1 PP-EB2-LWR PP-EB2-LWR		101 68 TO 127 106 65 TO 128 105 65 TO 128
References			
Reference	ID Target — ———— _	Found % Recov	very Control Limits
ICV	20.0	20.7 104	4 91 TO 114
PPBMULTI	20.0	21.1 106	6 91 TO 114
ICV	20.0	21.1 106	6 92 TO 114
CS1-7333	2.00	2.18 109	9 92 TO 114
1CA	20.0	20.2 101	1 91 TO 114
HP	10.0	10.7 107	7 91 TO 114
HIGHPURITY	20.0	20.1 100	92 TO 115
Blank Conce	entration Ana	lytical Batch #	Sample Numbers in Batch
<0.	.02	46585	202489-202510, 202512-202528, 202531-202533, 202535-202542, 202562-202586, 202606, 202608-202609,
0.	.03	46585	202489-202510, 202512-202528, 202531-202533, 202535-202542, 202562-202586, 202606, 202608-202609,
CALCIUM IN	SEDIMENT	mg/kg	SO Method: EPA 6010 Alt. Method: None
Duplicates PPB Number	Client ID		Value 1 Value 2 Range % RSD QC Control Limit
202547	DD E UDDO		142000 440000 00000 10000
202557	PP-5-UPR2		143000 118000 25000 13.55 12.35
202587	PP-19-UPR2		5730 5070 660 8.64 NO DATA
	PP-3-LRW1		126000 162000 36000 17.68 19.50
202589	PP-5-LRW1		193000 193000 0 0.00 42.53



ENVIRONMENTAL LABORATORIES, INC.

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Duplicates PPB Number	Client ID			Va.	lue	1	Value	2 I	Range	% R5	SD QC	Contro	l Limit
202597 202597	:			213 214			33000 35000			32.70 32.01		26.03 41 .07	
Spikes													
										•			
PPB Number	Client ID			% M	S %	MSD	Contr	ol I	Limits	% RSD	Contr	ol Lim	it
202548	PP-10-UPR1			12	 4 ·		77	то	131				
202550	PP-12-UPR1			9					146				
2025 58				_					220				
202590									139				
202594	PP-12-LRW2			10	1 .		70	TO	143				
202598	PP-17-LRW2			19	7		65	TO	140				
References													
Reference :	ID Target	Found %	Recov	ery Con	tro	l Li	mits						
PP222	2970	3594	121	85	TO	129)						
PP222 ICV	2970 20.0	3594 20.6	121 103			129 135							
ICV													
ICV Blanks		20.6	103	83	TO	135		atcl	1				
Blanks Blank Conce	20.0	20.6	103	83	Nu	135	s in B		1 -				
Blanks Blank Conce	20.0 entration Ana	20.6 lytical Ba 	103	83 Sample202589	Nu:	135 mber 2604	s in B	07,	-	ult. Me	ethod:	: None	
Blanks Blank Conce <0 CALCIUM IN	20.0 entration Ana	20.6 lytical Ba 	103	83 Sample202589	Nu:	135 mber 2604	s in B	07,	-	lt. M∈	ethod:	: None	
ICV Blanks Blank Conce	20.0 entration Ana .02 SEDIMENT	20.6 lytical Ba 	103	83 Sample 202589	TO Nui -20:	135 mber 2604	s in B , 2026	07,	- LO #				ol Limit
Blanks Blank Conce <0 CALCIUM IN Duplicates PPB Number	20.0 entration Ana02 .02 SEDIMENT Client ID	20.6 lytical Ba 	103	83 Sample 202589 VG Va	Num20:	135 mber 2604 etho	, 2026	07,	- LO A	% RS	SD QC		
Blanks Blank Conce <0 CALCIUM IN Duplicates	20.0 entration Ana02 .02 SEDIMENT Client ID PP-3-MAC1	20.6 lytical Ba 	103	83 Sample 202589 VG Va. 2600	Modellue	135 mber 2604 etho	zs in B , 2026 d: EPA Value	07, 601	- LO A Range 	% RS	SD QC	Contro	
ICV Blanks Blank Conce <0 CALCIUM IN Duplicates PPB Number 202619	20.0 entration Ana02 SEDIMENT Client ID PP-3-MAC1 PP-17-MAC1	20.6 lytical Ba 	103	83 Sample 202589 VG Va	Mar202 Mar. 100 Ma	135 mber 2604 etho	, 2026	07, 601	- LO A Range 700 4840	% RS	SD QC	Contro	

1.02

ENVIRONMENTAL LABORATORIES, INC.

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46913

Spikes

PPB Number	Client :	D			% 1	4S	% MSD			cove:	% RSD Control	
202620	PP-3-MA(:2				37		3	39 TC	140	 	
202630	PP-17-M	C2			9	92		4	1 TC	138	 	
202640	PP-5-RTS	52			9	95		4	3 TC	136	 	
2026 50	PP-19-R	S2			9	98		4	15 TC	135	 	
References Reference	ID Targ	jet —	Found	% Recove	ery Con	nti	col Lin	nits				
ICV	20	0.0	18.1	90	89	9 1	ro 119					
LCS1-7349	65	5.9	58.8	89	8:	L 1	123					
Blanks Conce	entration	An	alytical	Batch #	Sample	e 1	Numbers	s in	Bato	eh —		
<0.	. 02		469:	13	202619	9-2	202654,	,				
2.	. 34		469:	13	202619	9-2	202654,	,				

202619-202654,

ENVIRONMENTAL LABORATORIES, INC.

DATE, TIME, ANALYST REPORT

		PR	EP	ANAL	YSIS		
ANALYSIS	METHOD	DATE	BY	DATE	TIME	BY	MATRIX
%SOLIDS	EPA 160.3	/ /		02/19/01			so
AFDW		/ /		03/14/01			VG
AFDW		/ /		02/19/01	1043	FKE	WA
BLK DNSTY		/ /		02/20/01		LAW	so
CA/S/ICP	EPA 6010	02/26/01	ECS	03/13/01	0700	CEP	so
CA/S/ICP	EPA 6010	02/26/01	ECS	03/16/01	1539	SEK	so
CA/S/ICP	EPA 6010	02/26/01	ECS	03/21/01	0700	CEP	so
CA/S/ICP	EPA 6010	03/09/01	SEK	03/18/01	1000	CAH	VG
CA/T/ICP	EPA 200.7	02/19/01	SEK	02/20/01	0830	SEK	WA
CA/T/ICP	EPA 200.7	02/19/01	SEK	02/22/01	1030	SEK	WA
CA/T/ICP	EPA 200.7			03/09/01			WA
CA/T/ICP	EPA 200.7	02/27/01	BFC	03/21/01	0700	CEP	WA
DRY WEIGHT	SM 2540B	/ /		02/20/01			VG
DRY WEIGHT	SM 2540B	/ /		02/20/01	2000	CAB	WA
WET WEIGHT	SM 2540B	, ,		02/20/01			VG
WET WEIGHT	SM 2540B	, ,		02/21/01			WA
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IFAS Lab Reports

			WBL ANALY	TCAL DE	DOPT 20	01-02		
						11-02		
			Project: PSTA		ipies		 	1
			Sampling: February	uary 2001				
			3/20/01					
_	a .:	m: 1137	T: 11 TD		A 1 1	T -1. //	CDD	TOTOD
Log in	Sampling	Field No.	Field ID	Туре	Analysis	Lab #	SRP	TP/TDP
Date	Date		 				mg/L	mg/L
						1.501		0.000
2/7/01	2/6/01	P2-1200	TC-HC-W	W	TP	1501		0.023
		P2-1201	TC-3OUT-W	W	TP	1502		0.024
		P2-1202	TC-8OUT-W	W	TP	1503		0.013
		P2-1203	TC-13OUT-W	W	TP	1504		0.025
		P2-1204	TC-FD1-W	W	TP	1505		0.025
2/7/01	2/6/01	P2-1205	TC-HC-W	W	TDP	1506		0.013
		P2-1206	TC-3OUT-W	W	TDP	1507		0.012
		P2-1207	TC-8OUT-W	W	TDP	1508	1	0.007
		P2-1208	TC-13OUT-W	W	TDP	1509		0.015
2/7/01	2/6/01	P2-1209	TC-FD1-W	W	TDP	1510	<u> </u>	0.016
							<u> </u>	
2/9/01		P2-1633	FS-EB1	W	TP	1524		0.001
2/9/01	2/8/01	P2-1647	FS-EB1	W	TP	1538		0.001
2/13/01	2/12/01	P2-0793	PP-1OUT-W	W	TP	1543		0.013
		P2-0794	PP-2OUT-W	W	TP	1544		0.016
		P2-0795	PP-3OUT-W	W	TP	1545		0.010
		P2-0796	PP-4OUT-W	W	TP	1546		0.008
		P2-0797	PP-5OUT-W	W	TP	1547		0.013
		P2-0798	PP-6OUT-W	W	TP	1548		0.014
		P2-0799	PP-7OUT-W	W	TP	1549		0.011
		P2-0800	PP-8OUT-W	W	TP	1550		0.013
		P2-0801	PP-9OUT-W	W	TP	1551		0.009
		P2-0802	PP-10OUT-W	W	TP	1552		0.010
		P2-0803	PP-11OUT-W	W	TP	1553		0.015
		P2-0804	PP-12OUT-W	W	TP	1554		0.037
		P2-0805	PP-13OUT-W	W	TP	1555		0.009
		P2-0806	PP-14OUT-W	W	TP	1556		0.013
		P2-0807	PP-15OUT-W	W	TP	1557	1	0.017
		P2-0808	PP-16OUT-W	w	TP	1558		0.025
		P2-0809	PP-17OUT-W	W	TP	1559		0.012
		P2-0810	PP-18OUT-W	W	TP	1560		0.012
		P2-0811	PP-19OUT-W	W	TP	1561		0.011
		P2-0812	PP-20OUT-W	W	TP	1562		0.021
		P2-0813	PP-21OUT-W	W	TP	1563		0.011
		P2-0814	PP-22OUT-W	W	TP	1564		0.011
		P2-0815	PP-23OUT-W	W	TP	1565		0.017
		P2-0816	PP-24OUT-W	W	TP	1566		0.017
		P2-0817	PP-HT1-W	W	TP	1567		0.019
		P2-0818	PP-HT2-W	w	TP	1568		0.019
	†	P2-0819	PP-HT3-W	W	TP	1569		0.021
		P2-0820	PP-FD1-W	W	TP	1570		0.011
	†	P2-0821	PP-FD2-W	W	TP	1571		0.013
	<u> </u>	P2-0822	PP-FD3-W	W	TP	1572		0.018
		P2-0823	PP-EB1-W	w	TP	1573		0.003

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						01-02		
	1		Project: PSTA	Water san	ples			
1 1			Sampling: Febr		<u> </u>			
			3/20/01	I				
Log in	Sampling	Field No	Field ID	Туре	Analysis	Lab#	SRP	TP/TDP
	Date	11014 110.	1 1010 12	- , , ,			mg/L	mg/L
Date	Dute							
2/13/01	2/12/01	P2-0824	PP-1OUT-W	w	TDP	1574		0.008
2/13/01	212101	P2-0825	PP-2OUT-W	w	TDP	1575		0.008
		P2-0826	PP-3OUT-W	W	TDP	1576		0.007
		P2-0827	PP-4OUT-W	w	TDP	1577		0.007
		P2-0828	PP-5OUT-W	w	TDP	1578		0.008
		P2-0829	PP-6OUT-W	w	TDP	1579		0.008
		P2-0830	PP-7OUT-W	w	TDP	1580		0.006
		P2-0831	PP-8OUT-W	W	TDP	1581		0.007
			PP-9OUT-W	W	TDP	1582		0.006
		P2-0832		W	TDP	1582		0.006
		P2-0833	PP-10OUT-W		TDP			0.008
		P2-0834	PP-11OUT-W	W		1584		
		P2-0835	PP-12OUT-W	W	TDP	1585		0.009
		P2-0836	PP-13OUT-W	W	TDP	1586		0.006
		P2-0837	PP-14OUT-W	W	TDP	1587		0.006
		P2-0838	PP-15OUT-W	W	TDP	1588		0.008
		P2-0839	PP-16OUT-W	W	TDP	1589		0.010
		P2-0840	PP-17OUT-W	W	TDP	1590		0.008
		P2-0841	PP-18OUT-W	W	TDP	1591		0.007
		P2-0842	PP-19OUT-W	W	TDP	1592		0.007
		P2-0843	PP-20OUT-W	W	TDP	1593		0.014
		P2-0844	PP-21OUT-W	W	TDP	1594		0.009
		P2-0845	PP-22OUT-W	W	TDP	1595		0.007
		P2-0846	PP-23OUT-W	W	TDP	1596		0.007
		P2-0847	PP-24OUT-W	W	TDP	1597		0.007
		P2-0848	PP-HT1-W	W	TDP	1598		0.009
		P2-0849	PP-HT2-W	W	TDP	1599		0.008
		P2-0850	PP-HT3-W	W	TDP	1600		0.011
		P2-0851	PP-FD1-W	W	TDP	1601		0.007
		P2-0852	PP-FD2-W	W	TDP	1602		0.006
		P2-0853	PP-FD3-W	W	TDP	1603		0.007
		P2-0854	PP-EB1-W	W	TDP	1604		0.002
2/13/01	2/12/01	P2-0855	PP-1OUT-W	W	SRP	1605	0.002	
		P2-0856	PP-2OUT-W	W	SRP	1606	0.002	
		P2-0857	PP-3OUT-W	W	SRP	1607	0.003	
		P2-0858	PP-4OUT-W	W	SRP	1608	0.003	
		P2-0859	PP-5OUT-W	W	SRP	1609	0.003	
		P2-0860	PP-6OUT-W	w	SRP	1610		
	· · · · · ·	P2-0861	PP-7OUT-W	W	SRP	1611		
		P2-0862	PP-8OUT-W	w	SRP	1612		
		P2-0863	PP-9OUT-W	W	SRP	1613		
		P2-0864	PP-10OUT-W	w	SRP	1614		
 		P2-0865	PP-11OUT-W	w	SRP	1615		
 		P2-0866	PP-12OUT-W	w	SRP	1616		
					1	1 1010	, 5.001	1

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	1		WBL ANALY	TICAL RE	PORT 20	01-02		
			Project: PSTA			-		
			Sampling: February		ipios		-	
			3/20/01	2001				
			3/20/01					
Log in	Sampling	Field No	Field ID	Туре	Analysis	Lab#	SRP	TP/TDP
Date	Date	red iv.	1 ICIG ID	1300	7 111117313	Date ii	mg/L	mg/L
Date	Date	P2-0868	PP-14OUT-W	w	SRP	1618	0.004	
		P2-0869	PP-15OUT-W	w	SRP	1619	0.002	
		P2-0870	PP-16OUT-W	w	SRP	1620	0.005	
		P2-0870	PP-17OUT-W	w	SRP	1621	0.004	
 		P2-0871	PP-18OUT-W	w	SRP	1622	0.002	
		P2-0872 P2-0873	PP-19OUT-W	w	SRP	1623	0.002	
		P2-0874	PP-20OUT-W	w	SRP	1624	0.003	
		P2-0874	PP-210UT-W	w	SRP	1625	0.003	
		P2-0875 P2-0876	PP-22OUT-W	w	SRP	1626	1	
			PP-23OUT-W	W	SRP	1627		
		P2-0877	PP-24OUT-W	W	SRP	1628		
		P2-0878		W	SRP	1629		
		P2-0879	PP-HT1-W	W	SRP	1630	0.003	
		P2-0880	PP-HT2-W		SRP		0.003	
		P2-0881	PP-HT3-W	W		1631		
		P2-0882	PP-FD1-W	W	SRP	1632	0.002	
		P2-0883	PP-FD2-W	W	SRP	1633	0.002	
		P2-0884	PP-FD3-W	W	SRP	1634	0.003	
		P2-0885	PP-EB1-W	W	SRP	1635	0.001	
2/14/01	2/13/01	P2-1235	TC-HC-W	w	TP	1636		0.022
2/14/01	2/13/01	P2-1236	TC-3OUT-W	W	TP	1637	ļ	0.022
		P2-1237	TC-8OUT-W	w	TP	1638	1	0.014
		P2-1238	TC-13OUT-W	w	TP	1639	<u> </u>	0.036
		P2-1239	TC-FD1-W	W	TP	1640		0.020
		12-1237	TC-IDI-W	_ **	11	1010		0.020
2/14/01	2/13/01	P2-1241	TC-HC-W	w	TDP	1641		0.013
		P2-1242	TC-3OUT-W	w	TDP	1642		0.011
		P2-1243	TC-8OUT-W	W	TDP	1643		0.006
		P2-1244	TC-13OUT-W		TDP	1644		0.019
		P2-1245	TC-FD1-W	W	TDP	1645		0.012
]	<u> </u>	T		T	
2/17/01		P2-1620	TC-3-8-23	w	TP	1646		0.035
		P2-1621	TC-3-9-23	W	TP	1647		0.033
		P2-1622	TC-3-10-23	W	TP	1648		0.020
		P2-1623	TC-3-11-23	W	TP	1649		0.037
		P2-1624	TC-3-12-23	W	TP	1650		0.038
		P2-1625	TC-3-13-23	W	TP	1651		0.039
		P2-1626	TC-3-14-23	W	TP	1652		0.074
		P2-1627	TC-3-15-23	W	TP	1653		0.026
		P2-1628	TC-3-13-out	W	TP	1654		0.029
		P2-1629	TC-3-3-out	W	TP	1655		0.010
		P2-1630	TC-3-1-out	W	TP	1656		0.019
		P2-1631	TC-3-9-out	W	TP	1657	1	0.061
		P2-1632	TC-3-3-out	W	TP	1658		0.019
		P2-1633	TC-3-11-out	W	TP	1659		0.028
		P2-1634	TC-3-2-out	W	TP	1660		0.010

			WBL ANALY	TCAL RE	PORT 20	01-02	l .	1
		, , , , , , , , , , , , , , , , , , ,	Project: PSTA			1		
			Sampling: Febru		l l			
			3/20/01	2001				
	-		3/20/01		<u> </u>			
Log in	Sampling	Field No.	Field ID	Туре	Analysis	Lab#	SRP	TP/TDP
Date	Date						mg/L	mg/L
		P2-1635	TC-3out	W	TP	1661		0.016
		P2-1636	TC-3-10-out	W	TP	1662		0.052
		P2-1637	TC-3-15-out	W	TP	1663		0.013
		P2-1638	TC-3-12-out	W	TP	1664		0.016
		P2-1639	TC-3-1-out	W	TP	1665		0.089
		P2-1640	TC-3-14-out	W	TP	1666		0.016
		P2-1641	TC-3out	W	TP	1667		0.024
		P2-1642	TC-3-2-out	W	TP	1668		0.079
		P2-1643	TC-3-6-out	W	TP	1669		0.059
		P2-1644	TC-3-8-out	W	TP	1670		0.032
		P2-1645	TC-3-5-out	W	TP	1671		0.061
		P2-1646	TC-3-4-out	W	TP	1672		0.064
		P2-1647	TC-3-7-out	w	TP	1673		0.034
		P2-1648	TC-3-3-out	W	TP	1674		0.072
2/14/01	2/13/01	P2-1241	TC-HC-W	W	TDP	1641		0.013
		P2-1242	TC-3OUT-W	w	TDP	1642		0.011
		P2-1243	TC-8OUT-W	W	TDP	1643		0.006
		P2-1244	TC-13OUT-W	w	TDP	1644		0.019
		P2-1245	TC-FD1-W	W	TDP	1645		0.012
			7	1				
2/17/01		P2-1620	TC-3-8-23	W	TP	1646		0.035
		P2-1621	TC-3-9-23	W	TP	1647		0.033
		P2-1622	TC-3-10-23	W	TP	1648		0.020
		P2-1623	TC-3-11-23	W	TP	1649		0.037
		P2-1624	TC-3-12-23	W	TP	1650		0.038
		P2-1625	TC-3-13-23	W	TP	1651		0.039
		P2-1626	TC-3-14-23	W	TP	1652	2	0.074
	-,	P2-1627	TC-3-15-23	W	TP	1653	3	0.026
		P2-1628	TC-3-13-out	w	TP	1654	1	0.029
		P2-1629	TC-3-3-out	W	TP	1655		0.010
		P2-1630	TC-3-1-out	W	TP	1656		0.019
		P2-1631	TC-3-9-out	W	TP	1657		0.061
		P2-1632	TC-3-3-out	W	TP	1658		0.019
		P2-1633	TC-3-11-out	W	TP	1659		0.028
		P2-1634	TC-3-2-out	W	TP	1660		0.010
		P2-1635	TC-3out	W	TP	1661		0.016
		P2-1636	TC-3-10-out	W	TP	1662		0.052
		P2-1637	TC-3-15-out	W	TP	1663		0.013
		P2-1638	TC-3-12-out	W	TP	1664		0.016
		P2-1639	TC-3-1-out	W	TP	1665		0.089
		P2-1640	TC-3-14-out	W	TP	1666		0.016
		P2-1641	TC-3out	W	TP	1667		0.024
		P2-1642	TC-3-2-out	W	TP	1668		0.079
		P2-1643	TC-3-6-out	W	TP	1669		0.059
		P2-1644	TC-3-8-out	W	TP	1670)	0.032

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			WBL ANALYT	TCAL RE	PORT 20	01-02		
		***************************************	Project: PSTA			01 02		
			Sampling: Febru		l l			
			3/20/01	2001				
			3/20/01					
Log in	Sampling	Field No.	Field ID	Туре	Analysis	Lab#	SRP	TP/TDP
Date	Date			7,1				mg/L
	?	P2-1645	TC-3-5-out	W	TP	1671	-	0.061
	<u> </u>	P2-1646	TC-3-4-out	W	TP	1672		0.064
		P2-1647	TC-3-7-out	W	TP	1673		0.034
	İ	P2-1648	TC-3-3-out	W	TP	1674		0.072
2/17/01	2/16/01	P2-0622	PP-EB1-FP	w	TP	1695		0.001
2/17/01		P2-0623	PP-EB2-FP	W	TP	1696		0.001
2/17/01		P2-0646	PP-EB1-WP	W	TP	1719		0.001
2/17/01		P2-0647	PP-EB2-WP	w	TP	1720		0.001
2/17/01		P2-0670	PP-EB1-BP	w	TP	1741		0.001
2/17/01		P2-0671	PP-EB2-BP	w	TP	1742		0.002
2/17/01	2/16/01	P2-0691		w	TP	1761		0.000
211/01	210/01	P2-0692		w	TP	1762		0.000
2/17/01	2/16/01	P2-0712	PP-EB1-LWR		TP	1782		0.000
217/01	2/10/01	P2-0713	PP-EB2-LWR		TP	1783		0.000
	 	12-0715	11-LDZ-LWK			1705		0.000
2/21/01	2/20/01	PP-1274	TC-HC-W	w	TP	1831		0.025
2/21/01	2/20/01	PP-1275	TC-3IN-W	w	TP	1832		0.025
		PP-1276	TC-3OUT-W	w	TP	1833		0.023
	ļ	PP-1277	TC-8IN-W	W	TP	1834	 	0.021
		PP-1278	TC-80UT-W	W	TP	1835		0.022
	 	PP-1278 PP-1279	TC-13IN-W	W	TP	1836		0.023
		PP-1279 PP-1280	TC-13IN-W	W	TP	1837		0.023
	 	PP-1280 PP-1281	TC-FD1-W	W	TP	1838	 	0.030
	1	PP-1281 PP-1282	TC-FD1-W	W	TP	1839		0.002
	}	PP-1202	IC-EDI-W	VV	IIF	1039		0.002
2/21/01	2/20/01	PP-1283	TC-HC-W	w	TDP	1840		0.014
2/21/01	2/20/01	PP-1284	TC-3IN-W	W	TDP	1841	1	0.014
	 	PP-1284 PP-1285	TC-3IN-W	W	TDP	1842		0.013
	 	PP-1285 PP-1286	TC-8IN-W	W	TDP	1843		0.013
	 	PP-1286 PP-1287	TC-80UT-W	w	TDP	1844	ļ	0.017
	-	PP-1287 PP-1288	TC-13IN-W	w	TDP	1845		0.008
		PP-1289	TC-131N-W	w	TDP	1846		0.017
	 	PP-1289	TC-FD1-W	W	TDP	1847		0.017
		PP-1291	TC-EB1-W	W	TDP	1848		0.002
	1	11-1271	10-DD1-44	 ''	1.01	1040		0.002
		1			1		1	
2/21/01	2/20/01	PP-1292	TC-HC-W	w	SRP	1840	0.005	
2/21/01	2/20/01	PP-1292	TC-HC-W	w	SRP	1849		
2/21/01	2/20/01	PP-1293	TC-3IN-W	W	SRP	1850	0.006	
2/21/01	2/20/01	PP-1293 PP-1294	TC-3IN-W TC-3OUT-W	W W	SRP SRP	1850 1851	0.006 0.002	
2/21/01	2/20/01	PP-1293 PP-1294 PP-1295	TC-3IN-W TC-3OUT-W TC-8IN-W	W W W	SRP SRP SRP	1850 1851 1852	0.006 0.002 0.007	
2/21/01	2/20/01	PP-1293 PP-1294 PP-1295 PP-1296	TC-3IN-W TC-3OUT-W TC-8IN-W TC-8OUT-W	W W W	SRP SRP SRP SRP	1850 1851 1852 1853	0.006 0.002 0.007 0.004	
2/21/01	2/20/01	PP-1293 PP-1294 PP-1295 PP-1296 PP-1297	TC-3IN-W TC-3OUT-W TC-8IN-W TC-8OUT-W TC-13IN-W	W W W W	SRP SRP SRP SRP SRP	1850 1851 1852 1853 1854	0.006 0.002 0.007 0.004 0.008	
2/21/01	2/20/01	PP-1293 PP-1294 PP-1295 PP-1296 PP-1297 PP-1298	TC-3IN-W TC-3OUT-W TC-8IN-W TC-8OUT-W TC-13IN-W TC-13OUT-W	W W W W W	SRP SRP SRP SRP SRP SRP	1850 1851 1852 1853 1854 1855	0.006 0.002 0.007 0.004 0.008 0.003	
2/21/01		PP-1293 PP-1294 PP-1295 PP-1296 PP-1297	TC-3IN-W TC-3OUT-W TC-8IN-W TC-8OUT-W TC-13IN-W	W W W W	SRP SRP SRP SRP SRP	1850 1851 1852 1853 1854	0.006 0.002 0.007 0.004 0.008 0.003	

			WBL ANALY	ICAL RE	PORT 20	01-02		
			Project: PSTA	Water san	ples			
			Sampling: Febr	uary 2001				
			3/20/01					
I og in	Compling	Field No.	Field ID	Туре	Analysis	I ah #	SRP	TP/TE
Log in Date	Date	Field No.	I ICIU ID	Турс	2 11111333	200 11	mg/L	mg/L
2/21/01		PP-1305	TC-EB1-P	w	TP	1862		0.00
2/21/01	2/20/01	FF-1303	IC-EBI-F	W	111	1002		
2/28/01	2/27/01	P2-1354	TC-HC-W	w	TP	1863		0.03
		P2-1355	TC-3OUT-W	W	TP	1864		0.02
		P2-1356	TC-8OUT-W	w	TP	1865		0.01
		P2-1357	TC-13OUT-W	w	TP	1866		0.03
		P2-1358	TC-FD1-W	W	TP	1867		0.02
		P2-1359	TC-HC-W	W	TDP	1868		0.01
		P2-1360	TC-3OUT-W	W	TDP	1869		0.01
		P2-1361	TC-8OUT-W	W	TDP	1870		0.00
		P2-1362	TC-13OUT-W	W	TDP	1871		0.01
2/28/01	2/27/01		TC-FD1-W	W	TDP	1872		0.01
			-					
2/28/01	2/27/01	P2-1654	TC-HC-W	W	TP	1873		0.02
		P2-1655	TC-8OUT-W	W	TP	1874		0.01
		P2-1656	TC-13OUT-W	W	TP	1875		0.03
		P2-1657	TC-HC-W	W	TDP	1876		0.01
		P2-1658	TC-8OUT-W	W	TDP	1877		0.00
		P2-1659	TC-13OUT-W	W	TDP	1878		0.01
		P2-1660	TC-HC-W	W	SRP	1879		
		P2-1661	TC-HC-W	W	SRP	1880		
		P2-1662	TC-HC-W	W	SRP	1881		
		P2-1663	TC-8OUT-W	W	SRP	1882	1	
		P2-1664	TC-8OUT-W	W	SRP	1883		
		P2-1665	TC-8OUT-W	W	SRP	1884		
		P2-1666	TC-13OUT-W		SRP	1885		
		P2-1667	TC-13OUT-W		SRP	1886		
		P2-1668	TC-13OUT-W	W	SRP	1887	0.002	

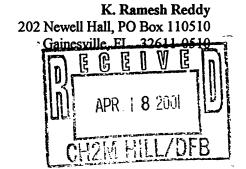
					WBL ANALYTICAL REPORT	YTICAL		2001-02					
					Project: PSTA Water samples	A Water	samples						
					Sampling: February 2001 3/20/01	ebruary 2(100						
QA/QC Report													
Parameters Date	Dunlicates	9			Spike					OC std			
				Precision		Sample	Expected	Observe	Recovery	_	Expected Observe	_	Accuracy
		mg/L	mg/L	%			mg/L		, %		mg/L	mg/L	%
Water SRP 2/14/01	1/01 R1610	0.001			1	45	0.0240	0.015	62.4	QC1(0.00225	0.00225	1	93.3
	R1619	0.002			SpDDI	0	0.0196	0.0191	97.4	QC2(0.0225)	0.0225	0.0217	96.4
	R1635	0.001	0.001	6.73									
		+											
Water SRP 3/1	3/1/01 R1879	0.0029	0.0029	0.00	Sp1880	0.0023	0.0219	0.0171	78.2	QC(0.0225)	0.0225	0.0228	
					SpDDf	0	Ш	0.0197	100.5	QC(0.0225)	0.0225		6'96
Water TP 2/20/01	1/01 R1492	-	0.021	0.20	Sp1492	0.021	0.068	0.067	98.50	000.078	0.078	0.074	95.34
	R1504	Н	0.053	0.78	Sp1504	0.053	0.099	0.095	95.90	QC0.078	0.078	0.074	95.41
	R1554	-	0.037	2.38	Sp1554	0.037	0.083	0.084	100.86	QC0.078	0.078	0.075	95.93
	R1558		0.025	1.45	Sp1558	0.025	0.071	0.072	101.62	QC0.078	0.078	0.076	97.31
	R1636	_	0.022	0.02	Sp1636	0.022	0.069	0.070	101.68	OC0.078	0.078	0.075	96.32
	R1639		0.036	1.01	Sp1639		0.082	0.084	102.41	QC0.078	0.078	0.075	96.44
	Dig R14		0.011	3.60	Dig Sp1499	- 1	0.088	0.082	92.77	000.078	0.078	0.076	96.89
	Dig R15		0.00	3.98	Dig Sp1561	- 1	0.088	0.080	91.25				
	Dig R15		0.013	2.92	Dig Sp1601	- 1	0.085	0.076	89.76				
	Dig R15	1 1	0.007	3.13	Dig Sp1645	0.012	0.089	980.0	96.17				
	Dig R1640	340 0.016	0.020	16.44									
Н										8	0000		
Water TP 2/21/01	_	\dashv	0.074	0.20	Sp 1652	0.074	0.118	0.118	99.47	38	0.078	0.071	0.00
	R 1668		0.079	0.88	Sp 1668	1_	0.122	0.122	19.66	3/8	0.078	0.071	16.00
	dig R 1653	Į	0.026	1.42	dig Sp 16/4	0.072	0.148	0.138	72.89	3	0.070	10.0	20.02
	dig R 16	0.077	0.079	1.39						3 8	0.078	0.078	8 51
			\downarrow							0002	0.078	0.072	92.60
	$\frac{1}{1}$									8	0.078	0.072	92.23
Water TP 3/2	3/2/01 R1831	1 0.025	0.025	0.69	Sp1831	0.025	0.072	0.071	99.74	QC0.078	0.078	0.068	87.58
╀	L	╁	0.030	0.27	Sp1837	0.030	0.076	0.076	99.54	QC0.078	0.078	0.076	98.96
	R1875	5 0.038	0.038	0.39	Sp1875	0.038	0.084	0.084	100.16	QC0.078	0.078	0.077	98.27
	R1866	\vdash	0.030	0.81	Sp1866	l	0.076	0.077	100.10	QC0.078	0.078	0.070	90.06
	Dig R18		0.023	0.49	Dig Sp1843	0.017	0.094	0.088	88.66	QC0.078	0.078	0.069	88.50
	Dig R1849	1	-	5.17	Dig Sp1856		0.090	0.081	90.46	QC0.078	0.078	0.077	99.21
	Dig R18	1	0.015	0.04						000.078	0.078	0.077	98.71
										000.078	0.078	0.068	87.47

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Institute of Food and Agricultural SciencesSoil and Water Science Department

Analytical Report No: 2001-3





Project: PSTA-	CH2MHILL
Date: <u>4/12/01</u>	
Sample type: Soil	Periphyton/Plant /Fish
Number of samples:	
Total phospho	rus: <u>120</u>
Total inorgani	c phosphorus:102
Plant/Fish tota	l phosphorus: 47
Ash content: _	47
Contact person:	Yu Wang Tel: 352-392-1804 ext. 333 Fax: 352-392-3399 E-mail: yuwang@gnv.ifas.ufl.edu

Tel: (352)392-8462

Fax: (352)392-3399

krr@gnv.ifas.ufl.edu

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			LYTICAL REP		13			
			TA Plant and F	ish				
			February 2001					
		Date: 4/12/	2001		ļ			
					<u> </u>			
Log in	Samplin	Field No.	Field ID	Туре	Analysis	Lab #	Ash cont	
Date	Date						%	mg/kg
2/17/01	2/16/01	P2-0723	PP-3-MAC	MC-plant	TP	1784	6.6	729.3
		P2-0724	PP-3-MAC	MC-plant	TP	1785	8.3	657.0
		P2-0725	PP-5-MAC	MC-plant	TP	1786	7.9	520.6
	·	P2-0726	PP-5-MAC	MC-plant	TP	1787	8.3	788.3
		P2-0727	PP-10-MAC	MC-plant	TP	1788	8.4	366.9
		P2-0728	PP-10-MAC	MC-plant	TP	1789	9.5	285.9
		P2-0729	PP-12-MAC	MC-plant	TP	1790	4.4	402.9
		P2-0730	PP-12-MAC	MC-plant	TP	1791	5.0	441.1
		P2-0731		MC-plant	TP	1792	4.4	297.1
		P2-0732	PP-14-MAC	MC-plant	TP	1793	3.5	243.6
	<u> </u>	P2-0733		MC-plant	TP	1794	5.7	383.5
		P2-0734		MC-plant	TP	1795	7.5	243.6
1,1		P2-0735		MC-plant	TP	1796	6.5	556.7
		P2-0736	PP-19 -MAC		TP	1797	5.9	462.4
		P2-0737	PP-20-MAC		TP	1798	11.1	744.8
		P2-0738	PP-20-MAC		TP	1799	9.7	428.3
		P2-0739	PP-FD1-MAC		TP	1800	7.1	676.9
2/17/01	2/16/01		PP-FD2-MAC		TP	1801	8.3	518.0
2/1//01	2/10/01	12-0740	11-1DZ-WAC	IVIC-plant		1001	1	5 2 5 . 5
2/17/01	2/16/01	P2-0741	PP-3-RTS	MC-plant	TP	1802	36.5	953.7
2/1//01	2/10/01	P2-0741	PP-3-RTS	MC-plant	TP	1803	39.8	1008.5
		P2-0742	PP-5-RTS	MC-plant	TP	1804	29.0	1152.2
	 	P2-0743	PP-5-RTS	MC-plant	TP	1805	21.3	1140.8
	 	P2-0745	PP-10-RTS	MC-plant	TP	1806	24.9	565.2
	 	P2-0745	PP-10-RTS	MC-plant	TP	1807	20.5	1041.1
-			PP-10-RTS		TP	1808	6.9	1185.2
	1	P2-0747	·	MC-plant MC-plant	TP	1809	6.4	1554.2
	ļ	P2-0748	PP-12-RTS				7.4	660.2
	ļ	P2-0749	PP-14-RTS	MC-plant	TP	1810		432.5
	<u> </u>	P2-0750		MC-plant	TP	1811	7.3	775.8
		P2-0751	PP-17-RTS	MC-plant	TP	1812	6.4	
	ļ	P2-0752	PP-17-RTS	MC-plant	TP	1813	8.1	648.3
		P2-0753	PP-19-RTS	MC-plant	TP	1814	11.9	1499.1
	ļ	P2-0754	PP-19 -RTS	MC-plant	TP	1815	8.7	1168.0
	ļ	P2-0755	PP-20-RTS	MC-plant	TP	1816	28.6	1470.4
		P2-0756	PP-20-RTS	MC-plant	TP	1817	34.7	1084.6
A 19 = 1=		P2-0757	PP-FD1-RTS		TP	1818	10.0	1208.9
2/17/01	2/16/01	P2-0758	PP-FD2-RTS	MC-plant	TP	1819	28.3	1400.7
0.42.22.22	0.5.5.5	De 25-5	DD 2 CC:-	1700	-	1000	02.7	272.5
2/17/01	2/16/01		PP-3-CON	FT	TP	1820	93.7	373.5
		P2-0760	PP-5-CON	FT	TP	1821	96.9	668.5
	ļ	P2-0761	PP-10-CON	FT	TP	1822	94.0	670.1
		P2-0762	PP-12-CON	FT	TP	1823	73.8	5016.0
		P2-0763	PP-14-CON	FT	TP	1824	93.6	209.7
		P2-0764	PP-17-CON	FT	TP	1825	85.7	1980.7
		P2-0765	PP-19-CON	FT	TP	1826	86.0	4066.7
×1000000000000000000000000000000000000		P2-0766	PP-20-CON	FT	TP	1827	94.5	160.6
		P2-0767	PP-21-CON	FT	TP	1828	79.8	1466.3
		P2-0768		FT	TP	1829	58.3	2714.5
2/17/01	2/16/01	P2-0769	PP-FD1-CON	FT	TP	1830	73.7	4955.1

	1	1'''	WBL ANAL	VTICAL I	DEDORT	2001.02	Γ	r
			Project: PSTA		KEPOK I	2001-03 T	<u> </u>	
					<u> </u>			
		 	Sampling: Fe Date: 4/12/20		J1			
T ag in	Sampling	<u> </u>	Date: 4/12/20	1 10				
Log in Date	Date	Field No.	Field ID	T	A Ii-	T -1- #	TPi	TP
Date	Date	Field No.	Lieid ID	Туре	Analysis	Lau #		
26061	2/9/01	D2 1620	EC 1 DE	0-11	TID TID:	1611	mg/kg	mg/kg
2/9/01	2/8/01		FS-1-INF	Soil	TP,TPi	1511	56.5	86.1
 		P2-1621	FS-1-CTR	Soil	TP,TPi	1512	67.9	129.0
		P2-1622	FS-1-OUT	Soil	TP,TPi	1513	75.9	106.6
		P2-1623	FS-2-INF	Soil	TP,TPi	1514	57.6	92.3
		P2-1624	FS-2-CTR	Soil	TP,TPi	1515	75.6	98.9
		P2-1625	FS-2-OUT	Soil	TP,TPi	1516	78.2	104.1
		P2-1626	FS-3-INF	Soil	TP,TPi	1517	142.3	161.3
		P2-1627	FS-3-CTR	Soil	TP,TPi	1518	35.8	46.5
ļ		P2-1628	FS-3-OUT	Soil	TP,TPi	1519	48.2	84.1
		P2-1629	FS-4-INF	Soil	TP,TPi	1520	37.6	407.5
		P2-1630	FS-4-CTR	Soil	TP,TPi	1521	52.1	276.1
	266	P2-1631	FS-4-OUT	Soil	TP,TPi	1522	41.3	401.3
2/9/01	2/8/01	P2-1632	FS-FD1	Soil	TP,TPi	1523	63.1	128.6
0/15/5	0/1/6/0	D0 05==		<u> </u>				
2/17/01	2/16/01	P2-0672	PP-3-UPR	Soil	TP, TPi	1743	982.4	973.8
		P2-0673	PP-3-UPR	Soil	TP	1744		1057.7
		P2-0674	PP-5-UPR	Soil	TP, TPi	1745	994.0	965.2
		P2-0675	PP-5-UPR	Soil	TP	1746		1065.5
		P2-0676	PP-10-UPR		TP, TPi	1747	935.2	876.4
		P2-0677	PP-10-UPR		TP	1748		1038.1
		P2-0678	PP-12-UPR		TP, TPi	1749	145.7	131.9
		P2-0679	PP-12-UPR		TP	1750		113.4
		P2-0680	PP-14-UPR		TP, TPi	1751	44.6	128.2
		P2-0681	PP-14-UPR		TP	1752		86.5
		P2-0682	PP-17-UPR		TP, TPi	1753	90.8	141.1
		P2-0683	PP-17-UPR		TP	1754		131.7
		P2-0684	PP-19 -UPR		TP, TPi	1755	10.5	24.5
		P2-0685	PP-19-UPR		TP	1756		23.2
		P2-0686	PP-20-UPR		TP, TPi	1757	9.8	19.5
		P2-0687	PP-20-UPR		TP	1758		17.4
		P2-0688		Soil	TP, TPi	1759	10.3	23.8
2/17/01	2/16/01	P2-0689	PP-FD2-UP	Soil	TP	1760		1093.6
2/17/01	2/16/01	P2-0693	PP-3-LWR	Soil	TP, TPi	1763	964.5	970.5
		P2-0694	PP-3-LWR		TP	1764		965.0
		P2-0695	PP-5-LWR		TP, TPi	1765		875.6
		P2-0696	PP-5-LWR		TP	1766		850.1
		P2-0697	PP-10-LWR		TP, TPi	1767	907.5	916.5
		P2-0698	PP-10-LWR		TP	1768		973.4
		P2-0699	PP-12-LWR		TP, TPi	1769	115.0	144.1
		P2-0700	PP-12-LWR		TP	1770		139.8
		P2-0701	PP-14-LWR		TP, TPi	1771	81.6	148.7
		P2-0702	PP-14-LWR		TP	1772		129.5
		P2-0703	PP-17-LWR		TP, TPi	1773	87.9	135.5
		P2-0704	PP-17-LWR		TP	1774		117.2
		P2-0705	PP-19 -LWR		TP, TPi	1775	9.2	16.7
		P2-0706	PP-19-LWR		TP	1776		15.9
		P2-0707	PP-20-LWR		TP, TPi	1777	6.8	19.0
		P2-0708	PP-20-LWR		TP	1778		21.7
		P2-0709		Soil	TP, TPi	1779	8.0	16.2
		P2-0710	 	Soil	TP	1780		993.9
2/17/01	2/16/01	P2-0711		Soil	TP	1781	890.5	898.5
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			WBL ANALYT	CAL REP	ORT 200	1-03		
			Project: PSTA P		Ĭ .			
			Sampling: Febru					
			Date: 4/12/2001					
Log in	Sampling	Field No.	Field ID	Туре	Analysis	Lab#	TPi	TP
Date	Date						mg/L	mg/kg
2/17/01	2/16/01	P2-0600	PP-3-FP	Peri	TP, TPi	1675	6.498	383.7
		P2-0601	PP-3-FP	Peri	TP	1676	6.465	367.3
		P2-0602	PP-5-FP	Peri	TP, TPi	1677	5.116	287.9
		P2-0603	PP-5-FP	Peri	TP	1678	5.321	309.
		P2-0604	PP-10-FP	Peri	TP, TPi	1679	1.986	210.1
		P2-0605	PP-10-FP	Peri	TP	1680	2.423	216.
		P2-0608	PP-14-FP	Peri	TP, TPi	1681	3.001	721.8
		P2-0609	PP-14-FP	Peri	TP	1682	2.924	690.3
		P2-0610	PP-17-FP	Peri	TP, TPi	1683	0.523	446.6
		P2-0611	PP-17-FP	Peri	TP	1684	0.601	396.5
		P2-0612	PP-19-FP	Peri	TP, TPi	1685	0.914	230.5
		P2-0613	PP-19-FP	Peri	TP	1686	1.324	219.6
		P2-0614	PP-20-FP	Peri	TP, TPi	1687	2.327	281.4
		P2-0615	PP-20-FP	Peri	TP	1688	2.038	284.2
		P2-0616	PP-21-FP	Peri	TP, TPi	1689	1.766	175.6
		P2-0617	PP-21-FP	Peri	TP	1690	1.984	170.7
	·	P2-0618	PP-22-FP	Peri	TP, TPi	1691	2.323	176.5
		P2-0619	PP-22-FP	Peri	TP	1692	2.699	180.5
		P2-0620	PP-FD1-FP	Peri	TP, TPi	1693	1.614	236.6
2/17/01	2/16/01	P2-0621	PPFD2-FP	Peri	TP	1694	1.043	215.8
2/17/01	2/16/01	P2-0624	PP-3-WP	Peri	TP, TPi	1697	4.718	199.4
		P2-0625	PP-3-WP	Peri	TP	1698	3.215	189.9
		P2-0626	PP-5-WP	Peri	TP, TPi	1699	4.357	293.
		P2-0627	PP-5-WP	Peri	TP	1700	3.587	316.8
		P2-0628	PP-10-WP	Peri	TP, TPi	1701	3.041	156.6
		P2-0629	PP-10-WP	Peri	TP	1702	3.056	155.6
		P2-0630	PP-12-WP	Peri	TP, TPi	1703	1.751	236.4
		P2-0631	PP-12-WP	Peri	TP	1704	1.614	253.0
		P2-0632	PP-14-WP	Peri	TP, TPi	1705	3.837	588.6
		P2-0633	PP-14-WP	Peri	TP	1706	4.115	619.4
		P2-0634	PP-17-WP	Peri	TP, TPi	1707	2.695	637.3
		P2-0635	PP-17-WP	Peri	TP	1708	3.742	641.8
		P2-0636	PP-19-WP	Peri	TP, TPi	1709	1.398	157.4
		P2-0637	PP-19 -WP	Peri	TP	1710	1.998	162.3
		P2-0638		Peri	TP, TPi	1711	0.146	720.8
		P2-0639		Peri	TP	1712	0.322	635.6
		P2-0640		Peri	TP, TPi	1713	0.756	155.2
		P2-0641	PP-21-WP	Peri	TP	1714	0.870	150.3
		P2-0642	PP-22-WP	Peri	TP, TPi	1715	0.854	172.3
		P2-0643		Peri	TP	1716	1.003	172.9
2/17/01		P2-0644	PP-FD1-WP	Peri	TP	1717	0.149	701.
	2/16/01	P2-0645	PPFD2WP	Peri	TP	1718	1.273	168.2

			WBL ANALYTI	CAL REP	ORT 200	1-03		
			Project: PSTA P	eriphyton				
			Sampling: Februa					
		****	Date: 4/12/2001					
Log in	Sampling	Field No.	Field ID	Туре	Analysis	Lab#	TPi	TP
Date	Date						mg/L	mg/kg
2/17/01	2/16/01	P2-0648	PP-3-BP	Peri	TP, TPi	1721	18.387	527.0
		P2-0649	PP-3-BP	Peri	TP	1722	14.679	650.2
		P2-0650	PP-5-BP	Peri	TP, TPi	1723	17.612	502.2
		P2-0651	PP-5-BP	Peri	TP	1724	13.952	491.1
		P2-0652	PP-10-BP	Peri	TP, TPi	1725	10.286	550.1
		P2-0653	PP-10-BP	Peri	TP	1726	10.202	628.5
		P2-0656	PP-14-BP	Peri	TP, TPi	1727	4.886	772.2
		P2-0657	PP-14 -BP	Peri	TP	1728	5.760	751.2
		P2-0658	PP-17-BP	Peri	TP, TPi	1729	8.41	781.2
		P2-0659	PP-17-BP	Peri	TP	1730	7.33	647.6
		P2-0660	PP-19-BP	Peri	TP, TPi	1731	1.780	323.8
		P2-0661	PP-19-BP	Peri	TP	1732	2.415	289.7
		P2-0662	PP-20-BP	Peri	TP, TPi	1733	2.102	223.4
		P2-0663	PP-20-BP	Peri	TP	1734	2.271	250.0
		P2-0664	PP-21-BP	Peri	TP, TPi	1735	2.015	270.0
1		P2-0665	PP-21-BP	Peri	TP	1736	1.439	297.2
		P2-0666	PP-22-BP	Peri	TP, TPi	1737	3.071	283.4
		P2-0667	PP-22-BP	Peri	TP	1738	3.18	283.2
		P2-0668	PP-FD1-BP	Peri	TP, TPi	1739	1.970	171.2
2/17/01	2/16/01	P2-0669	PP-FD2-BP	Peri	TP	1740	1.685	199.7
Log in	Sampling	Field No.	Field ID	Туре	Analysis	Lab#	TPi	TP
Date	Date						mg/L	mg/L
1/24/01	1/23/01	P2-1116	TC-3W-P	Per	TP,TPi	1486	1.778	15.59
		P2-1117	TC-8W-P	Per	TP,TPi	1487	0.212	4.30
		P2-1118	TC-13W-P	Per	TP,TPi	1488	1.278	13.14
		P2-1119	TC-FD1	Per	TP,TPi	1489	0.251	4.46
2/21/01	2/20/01	PP-1301	TC-3OUT-W	Peri	TP, TPi	1858	0.807	8.12
		PP-1302	TC-8OUT-W	Peri	TP, TPi	1859	0.256	
		PP-1303	TC-13OUT-W	Peri	TP, TPi	1860	1.425	
		PP-1304	TC-FD1-W	Регі	TP, TPi	1861	0.253	5.37

Γ						Iracy		102.4	104.9	6.4	107.5	102.4	104.9	102.4				I	91.7	0.86		100.4	101.5	101.3	100.7	102.1					101.5	103.0	103.2		93.9	99.2	101.9	\neg
-	<u> </u>	_	-	_		A Acc	%	-	┞	-	-	H		-				-	12	12			_		\vdash	\dashv				-	+	+-	\vdash	Н	\vdash	\dashv	Н	
						Observa	mg/L	4.609	4.722	4.722	4.836	4.609	4.722	4.609		mg/kg			1256.27	1343.21		0.452	0.457	0.456	0.453	0.460					0.457	0.464	0.465		0.423	0.447	0.459	
						Expected Observed Accuracy	mg/L	4.5	4.5	4.5	4.5	4.5	4.5	4.5		mg/kg			1370	1370		0.45	0.45	0.45	0.45	0.45					0.45	0.45	0.45		0.45	0.45	0.45	
					OC Std			8	8	8	8	&	သ	8					Peach 1	Peach 2		QC 0.45	QC 0.45	QC 0.45	QC 0.45	QC 0.45					OC 0.45	QC 0.45	OC 0.45		8	کر ا	8	
						ecovery	.0	101.2	100.5	93.0												101.8	103.0	103.4	102.8						100.8				104.7	108.8		
001-03						Expected Observed Recovery	mg/L %	7.785	7.785	5.800												0.915	0.577	0.545	0.897						0.895				0.884	0.770		_
EPORT 2	on	1				Expected (1	6.235												0.899	0.560	0.527	0.873						0.888				0.844	0.708		
YTICAL R	A Periphyt	bruary 200	100			Sample	mg/L	75	3.1343	1.5464												0.444	0.088	0.053	0.417						0.432				0.387	0.243		
WBL ANALYTICAL REPORT 2001-03	Project: PSTA Periphyton	Sampling: February 2001	Date: 4/12/2001		Spike			Sp 1784	Sp 1812	Sp 1820												Sp 1486	Sp 1689	Sp 1712	Sp 1729						Sp 1675	4			Sp 1676-2	Sp 2065		
L						uo						uo					uo		_								2	4		0						_		
L						Precisi	%RSD	1.29	1.29	0.00		Precision	8	88.6		0.16	Precision	%RSD	3.39			1.15	2.78	3.10	0.55		15.82			1 1	0.07				2.22	0.00		
							Ŋ/Bш	3.078	3.134	1.546			_	383.51	1400.71	4066.74	ıt (%)		5.74	28.29	86.01	0.444	0.088	0.053	0.417		1.778	2.327	1.998	2.584	0.432				0.387	0.243		
						11	mg/L	3.134	3.078	1.546		TP mg/kg	II	441.10	1293.96	4075.93	Ash conter	1 11	5.47	26.00	89.78	0.452	0.085	0.051	0.420		1.420	1.866	2.262	3.299	0.432				0.375	0.243		
					Duplicates			R 1784	R 1812	R 1820				dup 1794	dup 1819	dup 1826			dup 1794	dup 1819	dup 1826	R 1486	R 1689	R 1712	R 1729		dup 1486	dup 1687	lup 1710	dup 1737	R 1675				R 1676-2	R 2065		
					I			3/22/01									-					2/27/01					7	y)		3/21/01				3/30/01			
				QA/QC Report				TP (ashing)														0.01M HCI Pi									0.01M HCI Pi				0.01M HCI Pi			

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Γ	Τ	Τ	Γ			acy		ب	7	<u></u>	نہ	71	6	6	8	0	3		7	4	4	7	ဖ	6	4	6	2				6	<u>ر</u>	Γ	Γ				
						Accur	%	103.6	104.2	105.1	106.5	106.2	96.3	96.3	96.3	95.	92.3		109.7	109.4	108.4	109.2	109.6	108.9	110.4	108.9	111.5			95.4	96.9	98.5	L					
						Expected Observed Accuracy	mg/L	18.639	18.761	18.922	19.166	19.107	0.867	0.867	0.867	0.855	0.831		4.938	4.925	4.880	4.913	4.931	4.903	4.970	4.901	5.017		mg/kg	1307.2	1327.4	1349.6						
						Expected	mg/L	18.00	18.00	18.00	18.00	18.00	0.90	0.00	0.90	0.90	0.90		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		mg/kg	1370	1370	1370						
					OC Std			SC 18	QC 18	SC 18	SC 18	QC 18	OC 0:30	QC 0.90	QC 0.90	06:0 DD	QC 0:30		QC4.5	QC4.5	QC4.5	QC4.5	QC4.5	QC4.5	QC4.5	QC4.5	QC4.5				Peach 2	Peach 3						
						Recovery	%	107.1	102.7				95.7	94.1					107.2	103.7	102.7	103.4	104.7	105.4	103.7	103.3	102.9											
001-03						Observed		1	27.572				1.499	0.974					6.826	6.588	6.472	6.651	5.484	5.136	5.383	5.759	6.364											
EPORT 2	uo	-				Expected Observed Recovery		93	26.838				1.567	1.035					6.368	6.353	6.302	6.434	5.240	4.874	5.192	5.573	6.187											
YTICAL R	Periphyt	bruary 200	01				mg/L		19.521				0.723	0.1385				,	1.687	4.012	3.959	4.095	2.871	2.496	2.822	3.213	3.842											
WBL ANALYTICAL REPORT 2001-03	Project: PSTA Periphyton	Sampling: February 2001	Date: 4/12/20		Spike			Sp 1511	Sp 1763				Sp 1518	Sp 1777					Sp1520	Sp1743	Sp1763	Sp1780	Sp1682	Sp1705	Sp1722	Sp1727	Sp2056											
						Precision	%RSD	0.92	2.37	0.67			8.67	5.84				000	0.03	0.80	0.25	0.16	0.41	0.18	1.86	1.05	0.42	0.42		Precision	%RSD	8.49	6.75	4.88	1.57	3.38	1.35	8.69
							.	1.213	19.521	2.928			0.723	0.138					1.687	4.012	3.959	4.095	2.871	2.496	2.822	3.213	3.842	5.37		- 1	mg/kg	131.93	21.69	175.6	619.4	502.2	283.4	503.5
						=	mg/L	1.228	20.188	2.900			0.640	0.150					1.683	4.058	3.946	4.086	2.888	2.489	2.749	3.165	3.819	5.88		TP-II		116.99	19.71	188.2	633.3	478.8	288.9	569.4
				-	Duplicates			R 1511	R 1763	R 1526			R 1518	R 1777				903.4	K1520	K1743	R1763	R1780	R1682	R1705	R1722	R1727	R2056	Dup1861				Dig R1749	Dig R1778	DigR1689	DigR1706	DigR1723	DigR1737	DigR2073
								3/8/01					3/9/01					.00	4/9/01						4/10/01									7				
				QA/QC Report				IMHCI Pi					1MHCI Pi					30000	1r (HCIO4)						TP (HClO4)													

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WAR Lab Reports



March 30, 2001

Ms. Ellen Patterson CH2M Hill 800 Fairway Drive, Suite 350 Deerfield Beach, Florida 33441

Dear Ms. Patterson:

Enclosed are the diatom enumeration results for samples collected during the destructive sampling of the Porta PSTAs in the Everglades Nutrient Removal project area. Ten samples were analyzed, one (replicate A) from the downstream (OP) end of each tank sampled. I have included a copy of the specific procedure used during analyses of the samples. Also enclosed is a copy of general and specific comments regarding the sample results. The tables of results have been submitted unbound to facilitate your copying them if necessary and binding them in the manner you choose.

The enclosed computer disk contains a file (PS040.XLS) in Microsoft Excel format listing the diatom names and relative percentages of each taxa as presented in the table of results.

Please review this data set and call me if you have any questions or comments on the results.

Sincerely,

Michael K. Hein

michael K Hein

Staff Scientist

Enclosures

General and Specific Comments

Periphyton Stormwater Treatment Area (PSTA) Project Destructive Sampling Diatom Analyses Comments

A. GENERAL COMMENTS

- 1. Analyses of the February samples from the destructive sampling of the Porta PSTAs followed Water & Air's standard procedures for inverted microscope analyses and detailed diatom enumerations from permanent slides (a brief copy of the procedures used is enclosed).
- 2. Densities of diatoms considered "Alive" at the time of collection for the samples analyzed were highest on a per milliliter of sample basis in Sample PP3-OP-A (152,610 cells per milliliter) and lowest in Sample PP12-OP-A (578 cells per milliliter). Percentages of "Dead" diatoms ranged from 22.8 in Sample PP19-OP-A to 46.1 in Sample PP21-OP-A.
- 3. Taxa that accounted for at least 10% of the valves enumerated in a sample included Achnanthidium minutissimum, Cymbella pusilla, Encyonema evergladianum, Fragilaria famelica, Fragilaria synegrotesca, Mastogloia smithii var. lacustris, and Nitzschia semirobusta.

B. SPECIFIC COMMENTS ON SAMPLE SET

- 1. The taxonomic name for *Cymbella microcephala* has been changed (Krammer 1997) to *Encyonopsis microcephala*. The older name of this taxon was used during analysis of these samples to be consistent with results from previously analyzed samples.
- 2. The taxonomic name for *Eunotia pectinalis* var. *minor* is now *Eunotia minor* (Krammer & Lange-Bertalot 1991a). The older name of this taxon was used during analysis of these samples to be consistent with results from previously analyzed samples.
- 3. Some of the specimens listed as *Nitzschia linearis* var. *subtilus* also appeared similar to *N. gessneri* (Krammer & Lange-Bertalot 1988, p. 106, pl. 77, fig. 11-14) but could not be confirmed or separated because of the small number of specimens observed.
- 4. Some of the specimens listed as *Eunotia glacialis* in Sample PP14-OP-A may be *E. pectinalis*. Most of the valves enumerated for this taxon were frustules observed in girdle view and separation of these two taxa was difficult.

5.	A few of the specimens listed as <i>Achnanthidium minutissimum</i> approached the size range and characteristics of <i>Achnanthidium minutissimum</i> var. ? illustrated in Krammer & Lange-Bertalot (1991b, p. 60, pl. 32, fig. 27-30).	

Sample Analysis Procedures

Diatom Identification/Enumeration Procedure for Periphyton Stormwater Treatment Area (PSTA) Project Destructive Sampling

Upon arrival, the 60 formalin preserved samples were checked against the chain-of-custody form and logged into a permanent sample logbook. The samples were stored at room temperature (in the dark when possible) until analyzed. Two types of analyses were done for each of the samples analyzed. Because the Porta PSTAs had been in use for more than a year under various environmental conditions, the samples were first analyzed to determine the percentage of live (at the time of collection) versus dead diatoms and visual verifications made of their taxonomic distribution. A second aliquot was cleaned (all organic material oxidized) and permanent slide mounts made for critical determination of the relative percentages of the diatom taxa in the samples.

The determination of live versus dead diatoms in the samples was done using the Utermöhl (1931, 1958) method for inverted microscope examination. After each sample was thoroughly mixed by shaking, a known aliquot of 1 to 5 milliliters (mL) (following serial dilution if necessary) was transferred into a standardized plankton sedimentation chamber with a known settling area of 397.6 square millimeters (mm²). Following 24 hours of settling (or at least 4 hours per centimeter of solution height in the chamber), the chamber was placed on a Zeiss inverted microscope (magnification to 1,000X).

The chamber was initially scanned at lower magnifications to confirm an even distribution of organisms in the chamber. Live versus dead diatom counts were made at 1,000X magnification by counting all diatoms within the field of view along at least one central transect of the chamber. Diatoms were considered living at the time of collection if the chromoplast was still present in the cell. Diatoms were considered dead at the time of collection if only empty frustules or small droplets of oil were present in the frustule.

"Alive" and "Dead" cells were enumerated and recorded on standardized bench sheets and later converted to the number of cells per milliliter (mL) using the following conversion equation and Water & Air's WARSTAT computer program:

$$cells/mL = \frac{C A_c}{N_t A_t V_a}$$

where C = number of cells counted

 A_c = area of chamber bottom (397.6 mm²)

N₁ = number of transects counted

 $A_t = \text{area of one transect at } 1,000 \text{X magnification } (4.95 \text{ mm}^2)$

V_a = volume of aliquot (mL) settled

Critical determination of the relative percentages of the diatom taxa in the samples was facilitated by cleaning approximately 30 ml of each sample with hydrogen peroxide and potassium dichromate to oxidize the organic matter including that contained within the diatoms (APHA, AWWA, and WEF 1998, p. 10-33). Following completion of the oxidation reaction, the samples were rinsed several times to remove the chemicals by filling the beakers with distilled water, letting them stand overnight, and decanting the supernatant above the settled diatoms. After the oxidation reaction chemicals had been rinsed from the samples, concentrated hydrochloric acid was added to the samples slowly to dissolve any calcium carbonate present. The samples were rinsed several more times until the pH returned to near neutral. Permanent slides were made of the cleaned diatoms with Naphrax mounting medium. Enumerations of diatom valves to determine relative abundances were made from these slides with a modified Olympus BHS compound microscope equipped with Normarski Differential Interference Contrast (DIC) optics. All diatoms were identified to species when possible using standard taxonomic references. Approximately 500 diatom valves were enumerated for each sample analyzed except for two samples (PP12-OP-A, 226 valves; PP17-OP-A, 427 valves) because of the low density of diatoms on the slides and in the samples.

References

- American Public Health Association, American Water Works Association, and Water Environment Federation (APHA, AWWA, and WEF). 1998. Standard Methods for the Examination of Water and Wastewater. 20th ed. American Public Health Association, Washington, D.C. 1,000+ pp.
- Krammer, K. & H. Lange-Bertalot. 1988. Bacillariophyceae, Teil 2: Bacillariaceae, Epithemiaceae, Surirellaceae. *In A. Pascher* (ed.), Süsswasserflora von Mitteleuropa, Vol. 2/2. Gustav Fischer Verlag, Stuttgart, W. Germany. 596 pp.
- Krammer, K. 1997. Die cymbelloiden Diatomeen, Eine Monographie der weltweit bekannten Taxa, Teil 2. *Encyonema* part., *Encyonopsis* and *Cymbellopsis*. Bibliotheca Diatomologica 37:1-469.
- Krammer, K. & H. Lange-Bertalot. 1991a. Bacillariophyceae, Teil 3: Centrales, Fragilariaceae, Eunotiaceae. *In A. Pascher* (ed.), Süsswasserflora von Mitteleuropa, Vol. 2/3. Gustav Fischer Verlag, Stuttgart, W. Germany. 567 pp.
- Krammer, K. & H. Lange-Bertalot. 1991b. Bacillariophyceae, Teil 4: Achnanthaceae. *In A. Pascher* (ed.), Süsswasserflora von Mitteleuropa, Vol. 2/4. Gustav Fischer Verlag, Stuttgart, W. Germany. 437 pp.
- Utermöhl, H. 1931. Neue Wege in der Quantitativen Erfassung des Planktons. International Vereinigung für Theoretische und Angewandte Limnologie, Verhandlungen 5:567-596.
- Utermöhl, H. 1958. Zur Vervollkommnung der Quantitativen Phytoplankton Methodik.

 International Vereinigung für Theoretische und Angewandte Limnologie, Mitteilung 9:1-38.

Alive Versus Dead Diatom Results

PERIPHYTON STORMWATER TREATMENT AREA (PSTA) PROJECT EVERGLADES NUTRIENT REMOVAL PROJECT - PORTA PSTA DEMOLITION PERIPHYTON/PHYTOPLANKTON ANALYSES - SAMPLED FEBRUARY 2001

Cells Per Milliliter

TAXONOMIC CLASSIFICATION	SAMPLE NO. DATE TIME	PP3-OPA 021301 1225	PP5-OPA 021301 1520	PP10-OPA 021401 0935	PP12-OPA 021401 1130	PP14-OPA 021401 1155
DIVISION CHRYSOPHYTA CLASS BACILLARIOPHYCEAE	(DIATOMS)					
ALIVE DEAD		152610 48996	7213 2699	20643 10843	578 289	2297 1285
TOTAL NUMBER OF ORGANISM	s	201606	9912	31486	867	3582
NUMBER OF TAXA		2	2	2	2	2

PERIPHYTON STORMWATER TREATMENT AREA (PSTA) PROJECT EVERGLADES NUTRIENT REMOVAL PROJECT - PORTA PSTA DEMOLITION PERIPHYTON/PHYTOPLANKTON ANALYSES - SAMPLED FEBRUARY 2001

Cells Per Milliliter

TAXONOMIC CLASSIFICATION	SAMPLE NO. DATE TIME	PP17-OPA 021501 0910	PP19-OPA 021301 0850	PP20-OPA 021201 1630	PP21-OPA 021201 1430	PP22-OPA 021201 1400
ALIVE		1478 530	96386 28514	6795 2088	27952 23936	79920 41767
TOTAL NUMBER OF ORGANISMS		2008	124900	8883	51888	121687
NUMBER OF TAXA		2	2	2	2	2

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PERCENT BY DENSITY

TAXONOMIC CLASSIFICATION	SAMPLE NO. DATE TIME	PP3-OPA 021301 1225	PP5-OPA 021301 1520	PP10-OPA 021401 0935	PP12-OPA 021401 1130	PP14-OPA 021401 1155
DIVISION CHRYSOPHYTA CLASS BACILLARIOPHYCEAE (D	(ATOMS					
ALIVE DEAD		75.7 24.3	72.8 27.2	65.6 34.4	66.7 33.3	64.1 35.9
TOTAL		100	100	100	100	100
NUMBER OF TAXA		2	2	2	2	2

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PERCENT BY DENSITY

TAXONOMIC CLASSIFICATION	SAMPLE NO. DATE TIME	PP17-OPA 021501 0910	PP19-OPA 021301 0850	PP20-OPA 021201 1630	PP21-OPA 021201 1430	PP22-OPA 021201 1400
ALIVE DEAD		73.6 26.4	77.2 22.8	76.5 23.5	53.9 46.1	65.7 34.3
TOTAL		100	100	100	100	100
NUMBER OF TAXA		2	2	2	2	2

Diatom Percent Abundance Results

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PERCENT BY DENSITY

TAXONOMIC SAMPLE NO. CLASSIFICATION DATE TIME	PP3-OPA 021301 1225	PP5-OPA 021301 1520	PP10-OPA 021401 0935	PP12-OPA 021401 1130	PP14-OPA 021401 1155
DIVISION CHRYSOPHYTA CLASS BACILLARIOPHYCEAE (DIATOMS)					
ACHNANTHES PUSILLA				1.4	
ACHNANTHIDIUM MINUTISSIMUM	2.0	11.8	6.5	60.8	28.0
AMPHIPLEURA PELLUCIDA					
BRACHYSIRA NEOEXILIS	1.0		0.4		
BRACHYSIRA VITREA	8.4	3.3	3.6	1.4	0.8
CYCLOTELLA MENEGHINIANA	0.2			1.4	0.4
CYMBELLA MICROCEPHALA	2.5	4.4	0.6	1.4	8.2
CYMBELLA PUSILLA	11.7	13.9	4.5	4.1	3.9
DIPLONEIS OBLONGELLA	0.4	0.4	0.4	1.4	0.4
DIPLONEIS OVALIS	0.4	0.8		<0.1	0.8
ENCYONEMA EVERGLADIANUM	17.4	48.4	9.9	5.4	4.3
ENCYONEMA HEBRIDICA					
ENCYONEMA MINUTUM				1.4	
ENCYONEMA SILESIACUM	0.4				
ENCYONEMA SILESIACUM V ELEGANS					
ENCYONEMA VULGARE	2.0	0.8	0.2		0.4
EUNOTIA GLACIALIS			0.2	1.4	3.9
EUNOTIA PECTINALIS V MINOR	0.4	0.8	1.8		
FRAGILARIA FAMELICA	3.5		3.4		1.2
FRAGILARIA FASCICULATA?					
FRAGILARIA SYNEGROTESCA	14.7	7.3	25.5		17.9
FRAGILARIA ULNA					
GOMPHONEMA AFFINE	0.2			2.7	2.3
GOMPHONEMA GRACILE	0.2			2.7	
GOMPHONEMA INTRICATUM V VIBRIO	1.0	0.4	1.2	1.4	1.2
GOMPHONEMA PARVULUM				1.4	
GYROSIGMA OBSCURUM? MASTOGLOIA LANCEOLATA				<0.1	
MULUUMIA					
MASTOGLOIA SMITHII	0.4	0.2	0.2	6.8	6.6
MASTOGLOIA SMITHII V LACUSTRIS	29.4 0.2	3.7	24.1	0.0	1.0
NAVICULA CRYPTOTENELLA NAVICULA PODZORSKII	0.2	0.6		<0.1	1.
MATCOLK FODDORBRII					
NAVICULA RADIOSA					1.
NAVICULA RADIOSA V PARVA NITZSCHIA FRUSTULUM			::	<0.1	
NITZSCHIA FRUSIUMUN NITZSCHIA LINEARIS V SUBTILUS	2.7	0.2	0.6	<0.1	0.
NITTO COURT DATES		0.2		<0.1	
NITZSCHIA PALEA NITZSCHIA PALEACEA					
NITZSCHIA PALEAFORMIS	0.6	0.4	0.8	1.4	1.
NITZSCHIA SEMIROBUSTA		2.3	15.2	6.8	10.
NITZSCHIA SERPENTIRAPHE	0.2	0.4	0.8		
NITZSCHIA SP (SMALL)					
RHOPALODIA GIBBA			0.2		1.
SELLAPHORA LAEVISSIMA					
	1				
POTAL.	100	100	100	101	10
TOTAL	100	100 19	100	101	10

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PERCENT BY DENSITY

TAXONOMIC SAMPLE NO. CLASSIFICATION DATE TIME	PP17-OPA 021501 0910	PP19-OPA 021301 0850	PP20-OPA 021201 1630	PP21-OPA 021201 1430	PP22-OP3 021201 1400
ACHNANTHES PUSILLA	<0.1		1.2		
ACHNANTHIDIUM MINUTISSIMUM	39.7	4.1	32.8		2.9
AMPHIPLEURA PELLUCIDA			0.4		
BRACHYSIRA NEOEXILIS	0.7	0.4		0.4	
BRACHYSIRA VITREA	2.1	0.1			0.8
CYCLOTELLA MENEGHINIANA					
CYMBELLA MICROCEPHALA	1.4	0.6	8.8	0.9	0.2
CYMBELLA PUSILLA	3.5	13.0	3.1	10.7	5.3
DIPLONEIS OBLONGELLA		0.1			
DIPLONEIS OVALIS	0.7	0.1		0.2	0.2
ENCYONEMA EVERGLADIANUM	3.5	9.3	14.5	11.3	8.6
ENCYONEMA HEBRIDICA				0.4	
ENCYONEMA MINUTUM			0.4	·	
ENCYONEMA SILESIACUM					
ENCYONEMA SILESIACUM V ELEGANS					0.:
ENCYONEMA VULGARE	0.7	1.8	0.4	3.0	0.
TOTAL CLACKET	0.7				
EUNOTIA GLACIALIS	1				
EUNOTIA PECTINALIS V MINOR			l	9.8	2.
RAGILARIA FAMELICA	0.7	1.9	14.5	1	1
RAGILARIA FASCICULATA?	2.8				
RAGILARIA SYNEGROTESCA	22.0	18.3	6.3	4.1	32.
FRAGILARIA ULNA	0.7				
GOMPHONEMA AFFINE					0.
GOMPHONEMA GRACILE	2.1		1.6	0.4	0.
GOMPHONEMA INTRICATUM V VIBRIO		0.4	0.4	0.2	0.
GOMPHONEMA PARVULUM					
GYROSIGMA OBSCURUM?					
MASTOGLOIA LANCEOLATA				0.2	0.
		0.4	0.4		
MASTOGLOIA SMITHII			2.1	48.8	33.
MASTOGLOIA SMITHII V LACUSTRIS	11.3	46.4	2.1	40.0	33.
NAVICULA CRYPTOTENELLA NAVICULA PODZORSKII					
at 1 County				İ	
NAVICULA RADIOSA		0.1			
NAVICULA RADIOSA V PARVA	<0.1	0.4	3.7	2.4	0.
NITZSCHIA FRUSTULUM	0.7	1.0	2.9	0.2	0.
NITZSCHIA LINEARIS V SUBTILUS		1.0	2.9	1	
NITZSCHIA PALEA		0.1	0.2	0.4	
NITZSCHIA PALEACEA	<0.1				
NITZSCHIA PALEAFORMIS			6.1	4.3	5.
NITZSCHIA SEMIROBUSTA	5.7	0.1	0.4	1.7	1.
VITZSCHIA SERPENTIRAPHE		0.6		0.7	1.
NITZSCHIA SP (SMALL)	<0.1				
RHOPALODIA GIBBA	0.7	0.4	1		
SELLAPHORA LAEVISSIMA					0.
POTAL	100	100	100	100	10
			1	1	2
NUMBER OF TAXA	22	1 21	1 19	19	

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STATION INDICES

SAMPLE NO.	DATE	TIME	SHANNON-WEAVER DIVERSITY BASE 2	EVENNESS (H/Hmax)	EVENNESS (H-Hmin)/ (Hmax-Hmin)
PP3-OPA	021301	1225	3.130	0.692	0.658
PP5-OPA	021301	1520	2.584	0.608	0.572
PP10-OPA	021401	0935	3.048	0.705	0.676
PP12-OPA	021401	1130	2.500	0.560	0.456
PP14-OPA	021401	1155	3.432	0.758	0.732
PP17-OPA	021501	0910	2.869	0.643	0.598
PP19-OPA	021301	0850	2.482	0.565	0.520
PP20-OPA	021201	1630	3.113	0.733	0.707
PP21-OPA	021201	1430	2.605	0.613	0.578
PP22-OPA	021201	1400	2.707	0.616	0.577
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